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Prepared for the Department of Veterans Affairs

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PREFACE

In January of 2001, at the request of Congress, the Veterans Health Administration (VHA) asked RAND's National Defense Research Institute to undertake a study of the Veterans Equitable Resource Allocation (VERA) system. VERA was instituted in 1997 and was designed to improve the allocation of the congressionally appropriated medical care budget to the 22 regional service networks that composed the Veterans Administration (VA) health system. Phase I of this study was completed in nine months and provided a qualitative analysis of VERA. Findings and recommendations from Phase I are reported in *An Analysis of the Veterans Equitable Resource Allocation (VERA) System,* published by RAND (Wasserman et al.) in September 2001. In Phase I, an analysis plan was developed to conduct a quantitative analysis of VERA and the potential impact of modifications to VERA on the VA health system. At the request of Congress, the VHA asked RAND's National Defense Research Institute to conduct the proposed analysis. This report describes the findings of Phase II, a quantitative analysis of VERA.

Study findings should be of interest to VA personnel, Congress, and other policymakers, particularly those interested in health care for veterans. Health economists and policy planners may also have an interest in the findings.

This research was sponsored by the Department of Veterans Affairs and was carried out jointly by RAND Health's Center for Military Health Policy Research and the Forces and Resources Policy Center of the National Defense Research Institute. The latter is a federally funded research and development center sponsored by the Office of the Secretary of Defense, the Joint Staff, the unified commands, and the defense agencies.

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BACKGROUND AND APPROACH

The Veterans Equitable Resource Allocation (VERA) system was implemented by the Veterans Health Administration (VHA) in 1997 in a continuing effort to improve the allocation of congressionally appropriated health care funds to the 21 Veterans Integrated Service Networks (VISNs).[1] VERA represents the most recent effort of the VHA to ensure that health care resources are allocated equitably and efficiently and supports VHA's commitment to provide high-quality health care to the veteran population. Reflecting this commitment, the VERA system was designed to adjust to changes in the geographical distribution of veterans over time as well as to regional differences in health care needs and the costs of providing care by periodically adjusting allocations. At the same time, the system was designed to be simple and to be responsive to the highest-priority veterans, those with service-connected disabilities.

Since VERA's inception, dramatic shifts in allocations have occurred from geographic areas with shrinking veteran populations to geographic areas with increasing numbers of veterans. These funding shifts prompted concerns in Congress that VERA was not distributing resources equitably across the VISNs, which could affect health care delivery to some veterans. In legislation enacted in late 2000 (Public Law No. 106-377), Congress directed the Department of Veterans Affairs (DVA) to determine "whether VERA may lead to a distribution of funds that does not cover the special needs of some veterans." The VHA contracted with RAND's National Defense Research Institute (NDRI) to conduct a short-term (nine-month) assessment of three specific areas of concern expressed by Congress:

- The impact of the allocation of funds under the VERA formula on VISNs and subregions with older-than-average medical facilities, with older or more disabled enrolled veterans, undergoing major consolidation, and/or with appointment backlogs and waiting periods in rural and urban subregions.
- Issues associated with the maintenance of direct affiliations between the DVA medical centers and university teaching and research hospitals.

[1]When VERA was first implemented, 22 VISNs were created. However, in FY 2002, VISNs 13 and 14 (Minneapolis and Lincoln) were consolidated to form one VISN, VISN 23, leaving a total of 21.

- Whether the VERA formula for allocating funds adequately accounts for differences in weather conditions when calculating the cost of construction and maintenance of health care facilities and whether VISNs that experience harsh weather require more resources.

To address these issues within the project's allotted time, the NDRI initially conducted a qualitative analysis of the VERA system (referred to below and throughout the present report as Phase I) gathering data from site visits, interviews, and published reports. Findings from that analysis appear in a report entitled *An Analysis of the Veterans Equitable Resource Allocation (VERA) System* (Wasserman et al., 2001).

The first report identified factors that may influence the costs of, and access to, care within the Veterans Administration (VA) system and assessed how VERA currently adjusts for those effects. Our overall conclusion was that VERA appears to be designed to meet its objectives of reallocating resources to match the geographic distribution of the veteran population more closely than did previous VA budget allocation systems. Among the specific findings of the report was that health care delivery costs might be affected by the age, physical condition, and historical significance of a VISN's facilities, factors for which VERA currently makes no adjustments. Another finding was that VERA's current case-mix adjustment methodology might not account adequately for differences in the average health status of veterans across VISNs.[2] In contrast, the influence of such factors as weather extremes and rural versus urban location appeared less clear. Finally, the report concluded that a comprehensive evaluation of the current system, as well as the potential effects of modifications to it, would require extensive, quantitative analysis; Congress subsequently requested such an analysis. The present report describes the results of that analysis (Phase II), which was also conducted by RAND on behalf of VHA.

The goal of Phase II was to evaluate the effect of a number of patient- and facility-specific factors (those specified by Congress as well as others identified in Phase I) on the variation in individual patient costs across VISNs and to assess the potential effects of modifications that might be made to VERA to compensate for such factors. Our approach was designed to be methodologically sound, yet simple; to yield policy-relevant recommendations; and to support the overall mission of the VA as well as the objectives of VERA. Analyzing data from a variety of sources (including the VA, the Centers for Medicare & Medicaid Services, and individual counties, nationwide), we evaluated the effects of 17 individual and 22 facility characteristics on variation in patient costs across VISNs. Two models were constructed to account for factors that affected patient costs. The first, referred to as the "fully specified model," included all sociodemographic and health status variables previously found to influence health care costs as well as a number of factors specified by Congress. The second model, referred to as the "policy model," was constructed by excluding from the fully specified model any variables that did not meet current VA policy objectives as well as

[2]VERA's current case-mix adjustment methodology consists of three patient care categories: Basic Vested Care, Basic Non-Vested Care (both for patients with relatively routine health care needs), and Complex Care (for patients who require more-substantial health care resources).

those related to efficiency considerations (for example, the number of direct patient care full-time-equivalent employees [FTEs] per 1,000 patients).

Estimates from the regression equations were used to predict patient-level costs, which were then aggregated to the VISN level to allow cross-VISN comparisons. The models were used to simulate the potential influence on VISN allocations of varying patient and facility characteristics. We compared actual fiscal year (FY) 2002 allocations to our "base case" model allocations to determine the influence of our regression-based approach on allocations. We also assessed the influence of alternative case-mix adjustments, and we tested the sensitivity of our results to the method used to allocate costs to patients and to the inclusion of those Basic Care Priority 7 patients who are not currently counted in VERA workload estimates.[3] Table S.1 describes the various models used in our analysis.

Table S.1

Descriptions of Models Used in Analysis

Model	Description
Fully specified model	Patient-level and facility-level regression equations designed to provide the best possible explanation of variation in patient and facility costs; includes variables believed to influence the costs of care and for which data were reasonably available.
Policy model	Patient-level and facility-level regression equations intended to be more appropriate for policy purposes than the fully specified model. Variables contained in the fully specified model were deleted if they (1) were not statistically significant; (2) were inconsistent with the VA's mission, vision, or values; and/or (3) failed to meet current VA policy objectives. Variables related to efficiency considerations (e.g., physician FTEs per 1,000 patients) were also deleted.
Base case model	Regression equation-based methodology that represents effort to take into account factors included in the current VERA allocation methodology (described in Chapter One); includes only variables that measure patient health status (three VERA patient categories) and research and education costs and adjusts for geographic variation in labor and non-labor costs.
VERA-3 policy model	Policy model that uses 3 VERA patient categories for case-mix adjustment.
VERA-10 policy model	Policy model that uses 10 VERA patient categories for case-mix adjustment.
VERA-47 policy model	Policy model that uses 47 VERA patient categories for case-mix adjustment.
VA DCG[a] policy model	Policy model that uses VA modified DCG patient categories for case-mix adjustment.

[a]Diagnostic Cost Group.

[3]The Basic Care Priority 7 patients who are not counted as VERA workload include those veterans who have incomes and net worth at or above an established threshold, whose illness/injury is non-service connected, and who do not fall within Priority Groups 1 through 6. They are expected to pay specified copayments for the care they receive. Throughout this report we refer to these patients as Basic Care Priority 7s. Table 1.1 provides complete definitions for each of the VA patient priority groups.

FINDINGS

The current VERA system for allocating resources to VISNs does not account for a number of measurable factors that affect patient care costs, including patient and facility characteristics that vary systematically across VISNs and that are largely beyond VISN directors' control. Alternative methods for allocating resources to VISNs, based on the principles that guide VERA but that better account for these factors, may produce a more equitable allocation system.

- Case-mix measures play a key role in explaining patient-level cost differences. Overall, more-detailed case-mix measures accounted for more of the variation in patient care costs than less-detailed measures. All three alternatives examined in this report had significantly more explanatory power than the method currently used in VERA.
- Age and sex independently affect patient care costs, controlling for alternative case-mix measures and other factors.
- The degree to which VA patients rely on Medicare providers for the care they receive has a significant impact on VA costs. As one might expect, patients who are more reliant on Medicare providers incur lower VA costs vis-à-vis those patients who receive little or no care from Medicare providers.
- Veterans who live in urban and suburban areas use more resources than those who reside in rural areas. At the same time, costs are higher for those veterans who must travel longer distances for care.
- Most facility infrastructure characteristics—including age, historical significance, total building count (the total number of buildings on a facility's campus), and average physical condition—do not appear to have a significant independent effect on patient care costs. However, a higher number of square feet of building space, both per patient (a measure of building capacity and the extent to which it is being used efficiently) and per acre of land (a measure of the density of the infrastructure), increased average facility costs.
- The choice of case-mix measure and the other factors included in the policy model influence whether teaching is an important factor in explaining patient care costs. Teaching intensity is a significant factor only with the VA Diagnostic Cost Groups (DCGs), where it has a negative effect on facility costs (facility costs decrease as the ratio of residents-to-physicians increases).
- Research intensity (measured by the research costs per 1,000 unique patients) is positively associated with facility costs.
- In comparing our simulation results to actual FY 2002 allocations, we found that for our base case—in which we applied our regression methodology and controlled for the same set of factors that the VA currently controls for—$282 million, or 1.5 percent of the total appropriation, would be redistributed across the VISNs.

- To determine the effect of including additional variables (e.g., age, gender, and Medicare reliance), we compared the simulations from the base case to those from the VERA-3 policy model. The total amount of money that is redistributed by the VERA-3 policy model, relative to the base case, is $433 million, or 2.4 percent of the total appropriation.
- To illustrate the effect of alternative case-mix measures, we compared simulations from the VERA-3 policy model with those from the other case-mix specifications. The choice of case-mix measure has a substantial impact on VISN allocations. Each of the three alternative case-mix measures examined here (VERA-10, VERA-47, and VA DCGs) would result in substantial movement of budget allocations across VISNs. The magnitude of the budget reallocation (relative to VERA-3) is sensitive to the choice of alternative case-mix measure. For some VISNs, the direction of the budget reallocation also varies by case-mix measure (i.e., some VISNs would gain if the VA shifted to VERA-10, but those same VISNs would lose if the VA shifted to VA DCGs). However, this shift in direction occurs only in cases where the gain or loss is relatively small.
- The results from the comparisons between the VERA-3 policy model and policy models with the other case-mix measures illustrate that the movement from VERA-3 to VA DCGs redistributes substantially more money than would the movement to either VERA-10 or VERA-47. At the national level, the move to VA DCGs would redistribute 1.9 percent of the total appropriation compared to approximately 1 percent under VERA-10 and VERA-47.
- Table S.2 depicts the full impact of moving from the current system to the regression-based methodology used in our analysis. It compares the policy model-simulated allocations for each case-mix specification to the actual FY 2002 allocations. It is interesting to note that when considering the effects of all changes at once, there is greater correspondence in terms of the set of VISNs that gain (or conversely, lose) relative to actual allocations between the VA DCG and the VA patient classification-based case-mix specifications. For example, in comparing allocations under VERA-10 and VA DCGs, the direction of the redistribution changes for only three VISNs. When the effect of case-mix was considered separately, we found that the direction of the redistribution was different for eight VISNs. This difference could be caused by a number of factors such as the inclusion of supplementals in the FY 2002 allocations or the effect of interactions between the case-mix and other patient or facility variables.
- Our results were relatively insensitive to several methodological factors: the method used to allocate costs to patients (for the alternative cost methods we were able to examine), whether or not the Basic Care Priority 7 patients were included in the patient and facility regression equations, and the year of data used to estimate the models.

Table S.2
Comparison of FY 2002 VERA Allocations with Simulated Allocations by Case-Mix Measure (in $1,000)

VISN	VERA FY 02 Actual Allocation	Base Case Model		VERA-3 Policy Model		VERA-10		VERA-47		VA DCGs	
		Simulated Allocation	Diff from FY 02	Simulated Allocation	Diff from FY 02	Simulated Allocation	Diff from FY 02	Simulated Allocation	Diff from FY 02	Simulated Allocation	Diff from FY 02
01 Boston	909,715	949,752	4.4%	934,580	2.7%	936,805	3.0%	940,086	3.3%	933,542	2.6%
02 Albany	497,198	509,791	2.5%	523,507	5.3%	514,263	3.4%	515,606	3.7%	510,899	2.8%
03 Bronx	1,037,301	894,427	-13.8%	921,046	-11.2%	923,713	-11.0%	924,130	-10.9%	929,513	-10.4%
04 Pittsburgh	936,020	937,539	0.2%	802,611	-14.3%	852,401	-8.9%	857,828	-8.4%	817,956	-12.6%
05 Baltimore	564,929	536,548	-5.0%	515,071	-8.8%	508,861	-9.9%	510,980	-9.5%	514,493	-8.9%
06 Durham	861,286	839,227	-2.6%	893,982	3.8%	893,365	3.7%	897,570	4.2%	891,158	3.5%
07 Atlanta	1,050,304	1,061,837	1.1%	1,068,961	1.8%	1,046,486	-0.4%	1,038,089	-1.2%	1,001,137	-4.7%
08 Bay Pines	1,437,387	1,441,697	0.3%	1,452,648	1.1%	1,479,467	2.9%	1,462,093	1.7%	1,518,067	5.6%
09 Nashville	831,591	879,664	5.8%	921,294	10.8%	909,424	9.4%	908,780	9.3%	895,348	7.7%
10 Cincinnati	682,951	652,254	-4.5%	534,547	-21.7%	559,036	-18.1%	568,307	-16.8%	584,123	-14.5%
11 Ann Arbor	750,330	748,752	-0.2%	797,467	6.3%	807,458	7.6%	808,811	7.8%	777,155	3.6%
12 Chicago	883,268	875,625	-0.9%	901,712	2.1%	910,360	3.1%	911,670	3.2%	906,665	2.6%
13 Minneapolis	508,738	486,750	-4.3%	499,848	-1.7%	510,891	0.4%	513,458	0.9%	568,469	11.7%
14 Lincoln	348,050	326,590	-6.2%	332,678	-4.4%	326,397	-6.2%	330,112	-5.2%	342,344	-1.6%
15 Kansas City	703,102	721,308	2.6%	712,742	1.4%	708,300	0.7%	711,605	1.2%	739,214	5.1%
16 Jackson	1,466,801	1,484,782	1.2%	1,574,262	7.3%	1,544,495	5.3%	1,539,069	4.9%	1,476,776	0.7%
17 Dallas	832,097	842,255	1.2%	841,575	1.1%	833,180	0.1%	827,937	-0.5%	805,983	-3.1%
18 Phoenix	715,290	717,759	0.3%	751,288	5.0%	733,353	2.5%	736,174	2.9%	738,035	3.2%
19 Denver	473,985	468,747	-1.1%	437,073	-7.8%	441,868	-6.8%	443,634	-6.4%	483,815	2.1%
20 Portland	824,844	825,236	0.0%	815,112	-1.2%	807,453	-2.1%	807,636	-2.1%	863,372	4.7%
21 San Francisco	931,506	966,438	3.8%	1,028,315	10.4%	1,008,070	8.2%	1,006,221	8.0%	999,954	7.3%
22 Long Beach	1,062,308	1,142,025	7.5%	1,048,681	-1.3%	1,053,354	-0.8%	1,049,206	-1.2%	1,010,984	-4.8%
23 Lincoln & Minneapolis*	856,788	813,339	-5.1%	832,526	-2.8%	837,289	-2.3%	843,570	-1.5%	910,814	6.3%
Total amount allocated	18,309,001	18,309,001		18,309,001		18,309,001		18,309,001		18,309,001	

*VISNs 13 and 14 recently merged to form VISN 23. The table shows results for VISNs 13 and 14 separately and together as VISN 23. The amount for VISN 23 is excluded from the total as it is already incorporated through individual entries for VISNs 13 and 14.

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- When we included Basic Care Priority 7 veterans in the simulations, approximately half of the VISNs received larger simulated allocations and half received smaller allocations, compared with the simulated allocations based on policy models that excluded these patients (but included Complex Care Priority 7 veterans).

POLICY IMPLICATIONS AND RECOMMENDATIONS

In light of our findings, we believe that the VA should consider modifying VERA to take greater account of patient and facility characteristics than it does now. Movement in this direction would retain most of the strengths of VERA while increasing the alignment between VISN allocations and patients' health care needs. Specifically, we believe that VERA should expand the number of adjustments that it currently makes to account for the patient- and facility-level variables included in the policy model.

In principle, the expansion could be accomplished by sequentially adjusting VERA's set of national prices—which are currently based on only three case types—for each variable included in the policy model. However, in practice, this modification would prove to be quite cumbersome. As a result, we recommend that the VA consider adopting an allocation system that relies on a regression/simulation framework similar to the one used in our analysis.

On the positive side, our modeling approach relies on data that are readily available and provides a method for generating VISN allocations after adjusting for both patient and facility characteristics. Our approach is also very flexible in that variables can easily be added or deleted to reflect changing policy objectives. We recognize, however, that our approach is somewhat complicated and may be difficult to implement. It may also represent a shift in underlying philosophy in that it attempts to link allocations more closely with particular costs (e.g., those related to treating more complex cases and other costs that are beyond the control of VISN directors) vis-à-vis the current VERA system. Thus, before the VA implements an allocation system along the lines of the one we have suggested here, we believe it is important to conduct additional analyses to better understand how particular variables influence VISN allocations and to educate all relevant stakeholders on the pros and cons of adopting the regression-based allocation framework and of making adjustments above and beyond those currently included in the VERA system.

Below are some specific recommendations that the VA should consider implementing once the additional analyses suggested above are completed.

Case-Mix Adjustment

- We believe that VERA should take greater account of case-mix differences across facilities and VISNs than is currently possible with the three-category system.

- We recommend adopting either the VERA-10 or the VA-DCGs case-mix measures.

Medicare Reliance

- We believe VERA should be modified to adjust for differences in Medicare reliance among VA patients. Although adjusting for Medicare reliance will undoubtedly increase the system's complexity, it will also make the system more equitable.

Academic Affiliations

- We believe the current method of funding education support and research support costs through separate allocations should be reconsidered if the allocation process is modified to include more refined case-mix measures and/or a broader set of individual and facility characteristics.

Other Variables

- With the exception of the case-mix variables, the variables in the individual-level policy model (e.g., age, sex, urban/rural location, and Medicaid long-term care generosity) add little incremental explanatory power, overall, once case mix is taken into account. However, these non-case-mix variables are statistically significant (see Table 3.2); there are sound conceptual reasons for including them in the model; and they have a substantial impact on the simulated allocations (see comparison between the base case simulation and the VERA-3 policy model simulation in Table 3.5). Therefore, we recommend that the VA include them.

The modeling approach used in our analysis provides a tool that VA policymakers can use for making resource allocation decisions. This tool can also be used for a wide range of simulations as well as for facility-level allocations.

To maintain the policy relevance of the model, it must be updated and refined on an ongoing basis. Moreover, to preserve the VA's objective of allocating resources in as equitable and simple a manner as possible, additional analyses are required to better understand why various adjustments lead to relatively large swings in VISN allocations and to more clearly explicate the set of "prices" that each VISN will face for treating different types of patients. In the coming months, RAND staff will be working with the VA to refine the model and to generate additional insight into the impact of controlling for additional variables on VISN allocations.

ACKNOWLEDGMENTS

We are extremely grateful for the valuable support that we received throughout this project from our Project Officers at the Veterans Health Administration (VHA), John Vecciarelli and Paul Kearns. They took extraordinary measures to ensure that we had timely access to the data we required to conduct the study and served as true partners every step of the way. We would also like to express our appreciation to Stephen Kendall and Robert McNamara of the VHA's Allocation Resource Center for fulfilling our data requests and adding analytical insights along the way. Thanks are also extended to John Vitikacs, Cortland Peret, and Susanne Mardres of VHA headquarters, who assisted us in a wide variety of ways during the course of the project. We are also indebted to the members of the VHA Steering Committee that was assembled to provide overall project guidance. We would like to thank Leigh Rohr for her assistance in preparing this manuscript and for providing general administrative support to the project. Finally, we have benefited greatly from the insightful comments we received on an earlier version of this report from Peter D. Jacobson, Geoffrey Joyce, and Judith R. Lave.

ACRONYMS

ADL	Activities of daily living
ALB	Account Level Budgeter
ARC	Allocation Resource Center
ARF	Area Resource File
BTU	British Thermal Unit
C&P	Compensation and pension
CBOC	Community-Based Outpatient Clinic
CC	Condition category
CDR	Cost Distribution Report
CMS	Center for Medicare & Medicaid Services
CPI	Consumer Price Index
CPT	Current Procedural Terminology
DCG	Diagnostic Cost Group
DRG	Diagnosis Related Group
DSS	Decision Support System
DVA	Department of Veterans Affairs
ESRD	End-stage renal disease
FSM	Fully specified model
FTE	Full-time-equivalent employee
FY	Fiscal year
GAO	(U.S.) General Accounting Office
HBPC	Home-based primary care

HCFA	Health Care Financing Administration
HCCs	Hierarchical Condition Categories
HERC	Health Economics Resource Center
ICD-9-CM	*International Classification of Diseases, Ninth Edition, Clinical Modification*
i.i.d.	Independently and identically distributed
LTC	Long-term care
MSG	Management Sciences Group
MSIS	Medicaid Statistical Information System
NDRI	National Defense Research Institute
NRM	Non-recurring maintenance
OIG	Office of the Inspector General
OLS	Ordinary least squares
OPC	Outpatient Clinic File
PM	Policy model
PRP	Prorated patient
PTF	Patient Treatment File
PTSD	Post-traumatic stress disorder
VA	Veterans Administration (DVA)
VAMC	Veterans' Administration Medical Center
VERA	Veterans Equitable Resource Allocation
VHA	Veterans Health Administration
VISN	Veterans Integrated Service Network

Chapter One

INTRODUCTION

The mission of the Veterans Health Administration (VHA) is to provide high quality health care to veterans. The Veterans Equitable Resource Allocation (VERA) system was instituted by the VHA in 1997 in a continuing effort to improve the allocation of congressionally appropriated health care funds to the 21 Veterans Integrated Service Networks (VISNs).[1] VERA was designed to fulfill this mission in an equitable, understandable, and efficient manner as well as to address the complexities of providing health care to veterans with service-connected disabilities, low incomes, and special health care needs (e.g., spinal cord injuries and post-traumatic stress disorder).

Although a number of studies have indicated that VERA is helping the VHA meet its goals and budget objectives, these studies have also suggested areas for improvement, such as revising patient classifications and developing methods to monitor and improve access to care for all veterans (Price Waterhouse LLP and the Lewin Group, Inc. 1998; General Accounting Office, 1997, 1998; AMA Systems, Inc., The Center for Naval Analysis Corporation, March and July 2000). In contrast to earlier VHA allocation systems, which were based largely on historical costs, VERA bases its allocation of funds primarily on the number of veterans served. Thus, since VERA's inception, dramatic shifts in allocations have occurred from geographic areas with shrinking veteran populations to geographic areas with increasing numbers of veterans.

These funding shifts prompted concerns in Congress that VERA was not distributing resources equitably across the VISNs, which could affect health care delivery to some veterans. In legislation enacted in late 2000 (Public Law No. 106-377), Congress directed the Department of Veterans Affairs (DVA) to determine "whether VERA may lead to a distribution of funds that does not cover the special needs of some veterans." The VHA contracted with RAND's National Defense Research Institute (NDRI) to examine three specific areas of concern expressed by Congress:

- An assessment of the impact of the allocation of funds under the VERA formula on VISNs and subregions with older-than-average medical facilities, with older or more-disabled enrolled veterans, undergoing major consolidation, and/or with appointment backlogs and waiting periods in rural and urban subregions.

[1]These VISNs span the United States, its territories, and the Philippines. In FY 2002, the number of VISNs was reduced from 22 to 21.

- An assessment of issues associated with the maintenance of direct affiliations between the DVA medical centers and university teaching and research hospitals.
- An assessment of whether the VERA formula for allocating funds adequately adjusts for differences in weather conditions when calculating the cost of construction and maintenance of health care facilities and whether VISNs that experience harsh weather require more resources.

To address these issues, the NDRI initially conducted a qualitative analysis of the VERA system. Findings from that analysis, which appear in *An Analysis of the Veterans Equitable Resource Allocation (VERA) System* (Wasserman et al., 2001), are summarized below. One finding of that report was that comprehensive evaluation of the current system, and of possible modifications to it, required extensive quantitative analysis. This report describes the results of such a quantitative analysis of the VERA system (Phase II), which was also conducted by RAND's NDRI on behalf of VHA.

DESCRIPTION OF THE VERA SYSTEM[2]

VERA represents VHA's most recent effort to implement a resource allocation system that is both equitable and efficient and that preserves, if not enhances, VHA's commitment to providing high-quality health care to the veteran population. VERA allocates most of the congressional appropriation to VHA for health care—over $21 billion in fiscal year (FY) 2002—to the 21 regional networks nationwide (see Figure 1.1). To do so, it first splits the appropriation into General Purpose funding and Specific Purpose funding.

General Purpose funds are used to cover the costs of patient care, research support, education support, equipment, and non-recurring maintenance (NRM). In FY 2002, these funds accounted for approximately 86 percent ($18.31 billion) of the congressional appropriation; supplemental funds allocated to five VISNs (totaling over $267 million) were also included as part of the General Purpose funds in FY 2002.[3] Specific Purpose funds ($3.02 billion in FY 2002) are used to finance the costs associated with programs that are administered by VHA headquarters, including, for example, the provision of prosthetic devices, quality improvement initiatives, and database development, as well as headquarters' administrative expenses. A portion of the Specific Purpose funds is held in reserve to cover contingencies that may arise during the course of the fiscal year.

Over 90 percent of General Purpose funding is intended for patient care. Within General Purpose funding, two patient types are identified: Basic Care and Complex Care;

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[2]See Wasserman et al., 2001, for a more complete description of VERA.

[3]Prior to 2002, supplemental adjustments were made to those VISNs that required additional funding over their VERA allocation; these funds were provided from the VHA's National Reserve fund, part of Specific Purpose funds set aside for unanticipated needs. In FY 2002, based upon projected revenues and expenditures, supplemental adjustments were included as part of the initial VERA allocation to five networks whose projected expenditures exceeded their expected revenues.

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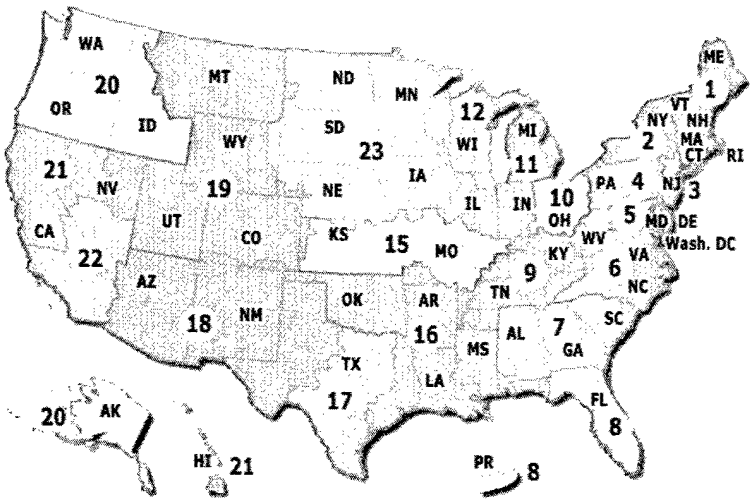

SOURCE: VHA web site.

NOTE: During FY 2002, two VISNs, 13 and 14, were consolidated to form VISN 23.

Figure 1.1—Veterans Health Administration Map of VISN Locations

and Basic Care is further divided into two subcategories: Vested and Non-Vested (Appendix A contains a description of the formulas used to allocate VERA funds in FY 2002).

The "Basic Vested" category includes patients with routine health care needs who either were hospitalized in a VA facility or received a comprehensive physical examination from a VA provider during the previous three years.

The "Basic Non-Vested" category includes patients who have relatively routine health care needs and have used some VA health services but did not receive inpatient services and did not receive a comprehensive medical evaluation by the VA system in the previous three years.

The "Complex Care" category includes patients who require substantial health care resources to treat a chronic illness or disabling condition, generally over a long time period. Many Complex Care patients are included in one of the VHA's special emphasis programs, such as spinal cord injury and post-traumatic stress disorder.

VERA funds for treating Basic and Complex Care patients are allocated to VISNs based on "workload," which is essentially a measure of the number of patients treated (however, in determining workload, Basic Care patients in Priority Group 7 are not counted; Table 1.1 provides the definitions of VA patient priority groups).[4]

[4]More precisely, Basic Care Priority 7 patients who are not counted as VERA workload include those veterans who have incomes and net worth at or above an established threshold, whose illness/injury is non-

Table 1.1

VERA Eligibility Categories and Priority Groups

Priority Group	Definition
1	Veterans with service-connected disabilities rated 50% or more disabling
2	Veterans with service-connected disabilities rated 30% or 40% disabling
3	Veterans who are former prisoners of war Veterans whose discharge was for a disability that was incurred or aggravated in the line of duty Veterans with service-connected disabilities rated 10% or 20% disabling Veterans awarded special eligibility classification under Title 38, U.S.C., Section 1151, "benefits for individuals disabled by treatment or vocational rehabilitation"
4	Veterans who are receiving aid and attendance or housebound benefits Veterans who have been determined by VA to be catastrophically disabled
5	Veterans with non-service-connected disabilities and veterans with service-connected injuries or illnesses who are rated 0% disabled, whose annual income and net worth are below the established dollar threshold
6	All other eligible veterans who are not required to make copayments for their care, including: • World War I and Mexican Border War veterans • veterans receiving care solely for disabilities resulting from exposure to toxic substances, radiation or for disorders associated with service in the Gulf War; or for any illness associated with service in combat in a war after the Gulf War or during a period of hostility after November 11, 1998 • veterans with service-connected injuries who are considered 0% disabled but qualify for compensation (compensable).
7	Veterans in Priority Group 7 have income and net worth at or above an established income level and are expected to pay a specified copayment. They form two subgroups: • 0% service-connected non-compensated Priority Group 7 Veterans include those veterans who do not fall into any of the above groups and whose illness/injury is service related but who are not entitled to compensation, because they are 0% disabled. These Priority Group 7 veterans can be included in both the VERA Basic Care and Complex Care components. Also included in this priority group, for the purpose of VERA workload credit, are veterans who receive compensation and pension exams and who are included in the VERA Basic Care component. • Non-service-connected Priority Group 7 veterans are those veterans who do not fall within Priority Groups 1 through 6 and whose illness/injury is not service related. They are not included in the VERA Basic Care component but are only included in the VERA Complex Care component.

SOURCE: Department of Veterans Affairs, 2002.

NOTES: The priority groups define the order of priority for VERA enrollment. These groups are numbered 1 through 7, with 1 conferring the highest priority for enrollment.

The VA calculates the amounts allocated annually per patient for treatment, referred to as "National Prices," for Basic Vested Care, Basic Non-Vested Care, and Complex Care patients by taking VERA's corresponding annual budget allocation for each of

service connected, and who do not fall within Priority Groups 1 through 6. They are expected to pay specified copayments for the care they receive. Throughout this report we refer to these patients as Basic Care Priority 7s. Table 1.1 provides complete definitions for each of the VA patient priority groups.

these categories and dividing by the forecasted national workload. For example, the Basic Vested Care price for FY 2002 was calculated by dividing the $10.1 billion budget allocation for Basic Vested Care by a forecasted workload of 3.3 million patients to obtain a National Price of $3,121 per patient. The National Prices for Basic Non-Vested and Complex Care in FY 2002 were $197 and $41,667, respectively.

The allocation to a particular VISN for care of patients in any category is the product of the VISN's workload estimate and the National Price for that care category. Adjustments to this figure are then made for geographic variation in the costs of non-contracted and contracted labor and contracted goods and services such as energy-related products, utilities, and provisions.[5]

In addition to covering the costs associated with patient care, VERA allocated over $1.4 billion to the VISNs in FY 2002 to support research, education, equipment purchases, and NRM expenses. Research support allocations to the networks for FY 2002 were based on the amount of research funded in FY 2000. Education support is allocated on the basis of the number of approved residents. In contrast, equipment and NRM funds are allocated strictly on the basis of workload. NRM is adjusted for geographic differences in construction costs.

UNDERSTANDING THE INCENTIVES CREATED BY VERA

Similar to other capitated systems, VERA presents VISN directors and facility administrators with a strong economic incentive to increase the number of cases treated (workload) while minimizing the costs per case.

However, unlike allocations determined by other government and private-sector capitation arrangements, the total allocation to VISNs is capped by the amount of the annual congressional appropriation. As a result, the VISNs compete for VERA funds in what is essentially a zero-sum game, and if the growth rate of the total annual appropriation falls short of the growth in workload, then per-patient resource allocations will decrease over time.

The incentive to minimize costs per case means that VISNs have an incentive to treat patients in the least costly setting possible and avoid unnecessary tests and procedures. At the same time, VERA provides an incentive to increase the number of patients who are likely to use few resources and to limit the number of patients who are expected to incur costs that are higher than the funding they generate. However, the extent to which such manipulation is possible or actually occurs is unclear and difficult to assess.

Another incentive for "gaming" the current three-class VERA system is created by the large disparity among per-patient allocations for the Basic Non-Vested ($197), Basic Vested ($3,121), and Complex ($41,667) Care categories. The VERA methodology for classifying patients includes some utilization measures such as number of "care

[5]Prior to 2002, a geographic adjustment was made only for non-contracted labor; geographic adjustments for contracted labor and non-labor contracted goods and services were instituted in FY 2002.

days." This inclusion of utilization measures in the classification system would allow a patient to be shifted from the Basic Care to the Complex Care class by, for example, increasing that patient's length of stay. Again, the extent to which this practice occurs is unclear.

In considering the incentives created by VERA, it is important to note that delivery of health care to veterans takes place within a larger context that both alters those incentives and constrains the behavior of health care administrators and providers. As illustrated in Figure 1.2, a complex interplay exists between VERA and a host of other factors that influence the cost, quantity, and quality of health care delivered to veterans. Thus, VERA plays a critical, yet in some respects limited, role in determining the care actually delivered to patients.

SUMMARY OF PHASE I FINDINGS AND RECOMMENDATIONS

In the initial phase of this project, RAND's charge was to address, over a period of nine months, the issues specified in the congressional mandate (Public Law No. 106-377) and outlined above. Because of the time constraint, we used qualitative research techniques to examine the issues and to generate research questions and hypotheses for future research. The data were gathered from government documents; an extensive review of the relevant health services research literature; a series of in-depth discussions with experts; and site visits to the Allocation Resource Center in Braintree, Massachusetts, and to selected VISNs. Over the course of Phase I, we interviewed over 175 people in 13 VISNs and 15 facilities across the country.

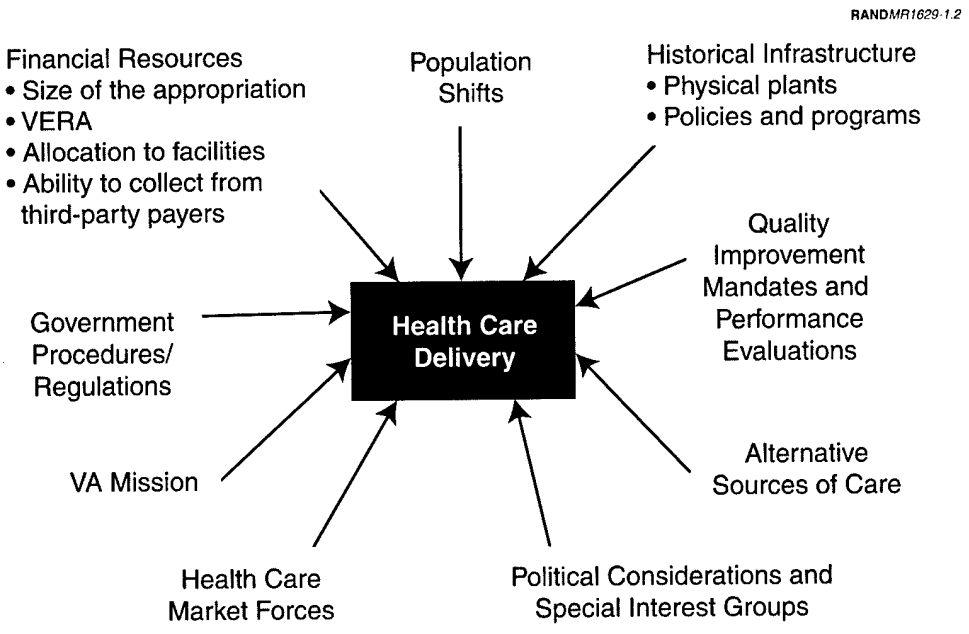

Figure 1.2—Influences on the VA Health Care System

Although interviewees raised many concerns about VERA, the overwhelming majority indicated that VERA was preferable to previous systems with respect to its incentive structure, fairness, and simplicity. Overall, it appeared that VERA is more successful than previous allocation systems in meeting its objectives of reallocating resources to match the geographic distribution of the veteran population more closely than did previous VA budget allocation systems. The main findings of Phase I are outlined here:

- Health care delivery costs may be affected by the age and physical condition of a VISN's capital infrastructure. Currently, VERA does not take these factors into account in determining VISN allocations.
- VERA's current case-mix adjustment, designed for simplicity, may not adequately account for differences in the average health status of veterans across VISNs and, as mentioned above, appears to provide incentives to game the system.
- External pressure from key stakeholders presents a formidable barrier to efforts to consolidate facilities and services, even when such consolidations may increase efficiency.
- VERA adjusts for the costs of academic affiliations directly attributable to research and education through education support and research support allocations. However, VERA makes no explicit adjustment for the potential effects that academic affiliation might have on other patient care costs. Moreover, the distinction between education support funds and patient care funds may be artificial because residents provide patient care services and affect productivity.
- Facilities with major academic affiliations generally benefit as referral centers in the VISN equipment fund allocations.
- The extent to which such factors as the number of facilities in an area, the breadth of services offered, rural versus urban location, and weather extremes influence costs and access to care remains unclear.
- No clear reason exists for adjusting VISN allocations for weather-related cost differences. Rather, the VA should investigate the extent to which prices of all non-labor inputs vary geographically, with an eye toward making appropriate allocation adjustments should the amount of variation prove significant. Any case-mix differences linked to weather should be accounted for through a comprehensive case-mix adjustment, rather than one that is simply targeted to weather-related conditions and procedures.
- A broad range of factors influence the cost and manner in which health care is provided to the veteran population. Thus, it is important that any potential adjustment not be considered in isolation. Rather, adjustments should be considered in the broader context of a comprehensive health care delivery cost model.

We recommended that the factors that appeared to be affected by VERA should be further clarified by a quantitative analysis. Such an analysis would provide significant insight into VERA and would yield valuable information about the potential need for,

and consequences of, various modifications to the VERA allocation system. Further, such an analysis would constitute a logical extension of the VA's ongoing effort to ensure that VERA remains an efficient, effective, and equitable resource allocation system.

PHASE II OBJECTIVES

The Phase I report identified some key issues that would require quantitative evaluation to resolve; however, such analysis was outside the scope of that initial phase of work. After reviewing the report and the results of that initial analysis, Congress proposed that the VHA contract with NDRI to conduct the analysis.

An underlying concern in Phase I, and one that was articulated in the legislation calling for this study, was whether the VERA system for allocating resources omitted consideration of certain factors, particularly factors that had a predictable and systematic impact on the costs of providing health care to veterans and were largely outside the control of VISN directors. Phase II was intended to evaluate the impact of these factors on the variation in patient costs across VISNs and to assess the potential effects of modifications that might be made to VERA to account for such factors.

The remainder of this report is organized as follows. Chapter Two describes the specifics of the analytic approach and the sources of data used in the analyses. Chapter Three presents the results of the quantitative analysis. Chapter Four presents our conclusions and recommended changes to VERA.

Chapter Two

DATA SOURCES AND METHODS

To assess the impact of various factors on the costs of providing care to veterans, we performed a quantitative analysis of VA patient and facility data. Our analyses were designed to incorporate the factors specified in the legislation authorizing this study, as well as other potentially important factors identified in Phase I of the study or by other researchers.

We approached our analysis with three general objectives in mind.

First, we had to structure the analysis to yield clear, policy-relevant, practical recommendations for VERA. Second, the analytical approaches we used had to be methodologically sound; in particular, they had to adjust for a comprehensive set of patient- and facility-level characteristics that might influence patient care costs. Here, we believed it was important to identify whether particular variables had a statistically significant effect on the costs of care and to have the ability to explore how VISN allocations would change in response to our attempts to adjust, or control for, a wide range of variables. Third, the analysis had to be designed to accommodate the VA's overall mission of providing health care to veterans as well as the specific objectives of VERA, particularly those related to equity and simplicity.

One of the main challenges we faced in developing our analytic approach was devising a way to incorporate patient- and facility-level factors and determining how these factors influence VISN allocations. VERA is fundamentally a capitation-based allocation system that allocates to each VISN a fixed dollar amount per patient enrolled in each of the three patient classes. Thus, we believed it was important to conduct the analysis at the patient level. At the same time, many of the factors of interest to both Congress and the VA are facility characteristics (e.g., teaching affiliations and condition of the physical plant). Consequently, we believed it was important to conduct a facility-level analysis in addition to the patient-level one.

Ultimately, however, VERA is used to allocate resources to VISNs, and any efforts made to account, or control, for additional patient or facility characteristics will affect VISN allocations. Thus, we believed our analyses should address the impact of any variable(s) on total VISN allocations. Potential modifications to "improve" VERA's ability to explain the variation in patient costs have limited value if they increase the system's complexity while doing little to change resource allocations at the VISN level. In essence, then, our analysis was conducted in three stages: patient, facility, and VISN.

OVERVIEW OF ANALYTIC METHODS

This section describes the motivations for our analytic approach and summarizes our methods. Subsequent sections in this chapter describe our analyses, including data and statistical methods, in detail.

Patient- and Facility-Level Equations

The first stage of our analysis focused on examining factors that affect health care costs at the patient level. Specifically, we used regression analysis techniques, described more completely below, to explain the variation in veterans' annual costs of care—including inpatient, outpatient, and long-term care costs—as a function of sociodemographic variables, health status measures, the availability of alternative sources of care, and the facility (or facilities, in the case of some veterans) where care was delivered. Table 2.1 lists the patient-level variables.

In the second stage of the analysis, we focused on identifying treatment facility characteristics that affect patient costs. We used the estimates for the facility variables that we obtained from the patient-level regression equations as the dependent variable in a set of facility regression equations. That is, the facility-level analysis was aimed at explaining the extent to which various facility characteristics explained differences in veterans' costs *after controlling for differences in the characteristics of the*

Table 2.1

Explanatory Variables Used in Patient-Level Equations

Variable	Note(s) (see below)
Age	1
Health status/case-mix measure	1
Income	3
Race/ethnicity	4
Sex	1
Marital status	3,4
Physicians per capita	1
Hospital beds per capita	1
Rural/urban status	1
Distance to closest facility	1
Distance to closest CBOC	1
VA priority	5
Medicare reliance	1
Medicare imputation indicator	1
Medicaid generosity—general	3
Medicaid generosity—long-term care	1
Facility indicator	1

NOTES: CBOC: Community-Based Outpatient Clinic. [1]Variable included in policy model; [2]Variable included in base-case regression equation; [3]Variable not included in policy model because it contains a potential measurement error; [4]Not consistent with mission/values; [5]Not consistent with current policies.

veterans that each facility serves. Thus, the facility equations attempted to explain cost differences as a function of each facility's location, infrastructure characteristics, labor and non-labor prices, medical school affiliations, research programs, and consolidation activity. Table 2.2 lists the facility-level variables.

In the third stage of the analysis, we used the patient- and facility-level regression equations we derived in stages 1 and 2 to predict each veteran's total annual costs, after controlling for both patient and facility characteristics. We then aggregated predicted patient costs to the VISN level to simulate how VISN allocations would vary after controlling for the variables included in the regression equations. Although we focused our analysis on VISN allocations, we could, in principle, aggregate the data in various ways. For example, we could aggregate the data by facility, state, or patient subpopulation. Here, it should be noted that the model could be used by VISN directors as the basis for making allocations to their facilities.

The three-stage structure of the analysis is attractive in that it provides a method for simulating how the VISN allocations would be affected by changes in any of the vari-

Table 2.2

Explanatory Variables Used in Facility-Level Equations

Variable	Note(s) (see below)
Rural/urban status	1
Residents per full-time physician	1,2
VA labor index	1,2
Average food cost per bed day	1
Energy price (dollars per million BTUs)	1
Contract labor costs	1
Square feet of building space per acre of land	1
Square feet of building space per unique patient	1
Research costs per 1,000 unique patients	1,2
Percentage of funded research	6
Average building age as of 2001	6
Average building condition	6
Leased square feet per patient	5
Ratio of historic to total number of buildings	6
Total number of buildings	6
Indicator for recent facility/management consolidation	6
Occupancy rate	5,6
Number of CBOCs per 1,000 unique patients	5
Direct patient care FTEs per 1,000 unique patients	5
Non-patient care FTEs per 1,000 unique patients	5
Long-term care beds per 1,000 unique patients	5
Special program beds per 1,000 unique patients	6

NOTES: Unique patient: measures the number of patients who are seen at least once at a facility during a given year (rather than the total number of visits). FTEs: full-time-equivalent employees. [1]Variable included in policy model; [2]Variable included in base-case regression equation; [3]Variable not included in policy model because it contains a potential measurement error; [4]Not consistent with mission/values; [5]Not consistent with current policies; [6]Not statistically significant.

ables included in the patient and facility equations. Variables can easily be added, deleted, or modified and a new set of predicted costs can be generated and aggregated at virtually any desired level.

Fully Specified and Policy Models

Using the patient- and facility-level regression equations, we constructed two types of models, with two distinct objectives in mind (see Table 2.3).

Our first model, which we refer to as the "fully specified model," was intended to provide the best possible explanation of variation in patient costs. Toward this end, we tried to identify and include variables in both the patient and facility equations that we believed might influence the costs of care and for which data were reasonably available. Here, we relied on our knowledge of the relevant literature, specific concerns raised in the legislation that required the VA to undertake this study, lessons learned through the case studies that were conducted during Phase I of the project, and our prior experience modeling individuals' health care costs.

Our second model, which we refer to as the "policy model," was intended to be more appropriate for policy purposes than the fully specified model. In constructing this policy model, we sought to delete those variables contained in the fully specified

Table 2.3

Descriptions of the Models Used in the Analysis

Model	Description
Fully specified model	Patient-level and facility-level regression equations designed to provide the best possible explanation of variation in patient and facility costs; includes variables believed to influence the costs of care and for which data were reasonably available.
Policy model	Patient-level and facility-level regression equations intended to be more appropriate for policy purposes than the fully specified model. Variables contained in the fully specified model were deleted if they (1) were not statistically significant; (2) were inconsistent with the VA's mission, vision, or values; and/or (3) failed to meet current VA policy objectives. Variables related to efficiency considerations (e.g., physician FTEs per 1,000 patients) were also deleted.
Base case model	Regression equation-based methodology that represents an effort to take into account factors included in the current VERA allocation methodology (described in Chapter One); includes only variables that measure patient health status (three VERA patient categories), and research and education costs; and adjusts for geographic variation in labor and non-labor costs.
VERA-3 policy model	Policy model that uses 3 VERA patient categories for case-mix adjustment.
VERA-10 policy model	Policy model that uses 10 VERA patient categories for case-mix adjustment.
VERA-47 policy model	Policy model that uses 47 VERA patient categories for case-mix adjustment.
VA DCG policy model	Policy model that uses VA-modified DCG patient categories for case-mix adjustment.

NOTE: DCG = Diagnostic Cost Group.

model that (1) were not statistically significant; (2) were inconsistent with the VA's mission, vision, or values; and/or (3) failed to meet current VA policy objectives. Variables related to efficiency considerations (e.g., the number of full-time-equivalent employees [FTEs] per 1,000 patients) were also deleted.

To assess the potential influence of the health status classification system on patient costs, we ran four different versions of both the fully specified and policy models, with each version relying on a different case-mix measure. These case-mix measures are described below.

Fully Specified Model. All widely used methods that account for interpersonal variation in health care costs adjust for at least some sociodemographic characteristics (e.g., Ash et al., 2000; Pope et al., 2000; Weiner et al., 1998; Kronick et al., 2000; Averill et al., 1999; von Korff et al., 1992). Numerous studies have shown that age and sex are correlated with health care utilization and health status (McClure, 1984; Lubitz, 1987; Hornbrook, Goodman, and Bennett, 1991; Hoff and Rosenheck, 1998; Kazis et al., 1998), in part because they are correlated with physiological developments such as degeneration of body systems. Social factors, such as marriage and education, are also predictive of health status, although the causal pathways are poorly understood (Lillard and Panis, 1996; Goldman and Smith, 2002). Thus, the fully specified model controls for age, sex, racial/ethnic origin, marital status, and income. In addition to examining the effects of sociodemographic factors on patient cost variations, we were led, by the legislation that required the VA to undertake the study, to focus on the effects of a variety of other factors. These factors included the clinical characteristics of the patients treated (i.e., case mix), infrastructure characteristics, facility and management consolidations, and facility location (urban versus rural). Figure 2.1 depicts an overview of the fully specified model.

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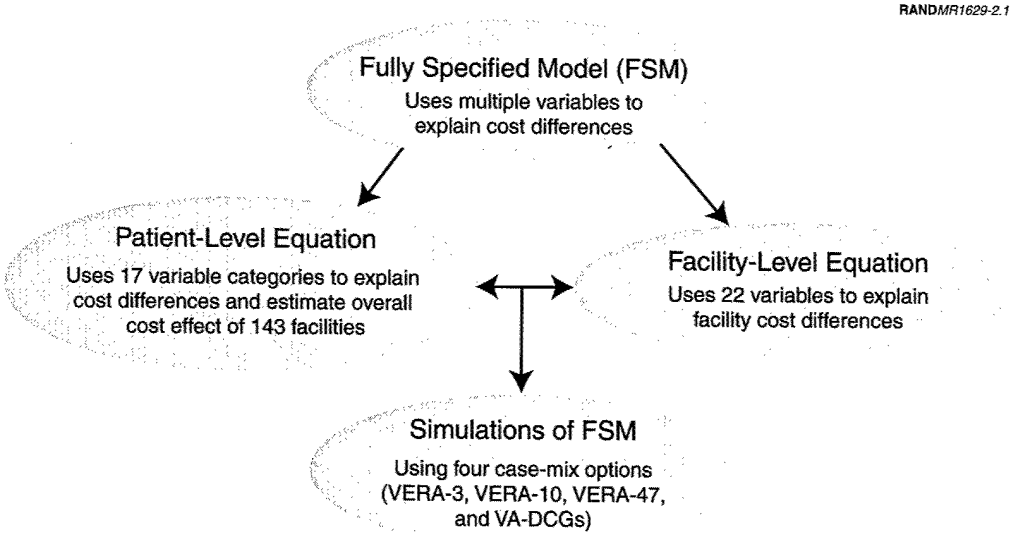

Figure 2.1—Overview of Construction of the Fully Specified Model

"Policy" Model. In keeping with our desire to include in the policy model only variables that meet current VA policy objectives, we deleted a number of variables from the fully specified model. For example, we deleted variables related to efficiency considerations (e.g., direct patient care FTEs per 1,000 unique patients). We reasoned that statistically controlling for such variables might lead to an undesirable set of financial incentives that reward inefficient behavior. That is, if we included variables in the model related to efficiency considerations (such as the number of FTEs per 1,000 patients) over which VISN directors have some degree of control, we would risk embedding inefficiencies into the allocation scheme. Using the example of the variable for FTEs per 1,000 patients, if this variable were included in the policy model, the VA could end up rewarding VISNs that, by some measure, have too many staff members. Figure 2.2 shows the various steps that were undertaken to construct the policy model.

It is important to note that both the fully specified and policy models can potentially serve several purposes. For example, the fully specified model could be used to generate insight into the VERA supplemental, or adjustment, process. That is, because the fully specified model attempts to explain as much of the variation in costs as possible, it could be applied to assess the degree to which a VISN's request for supplemental funding is due to factors within or beyond its director's control.

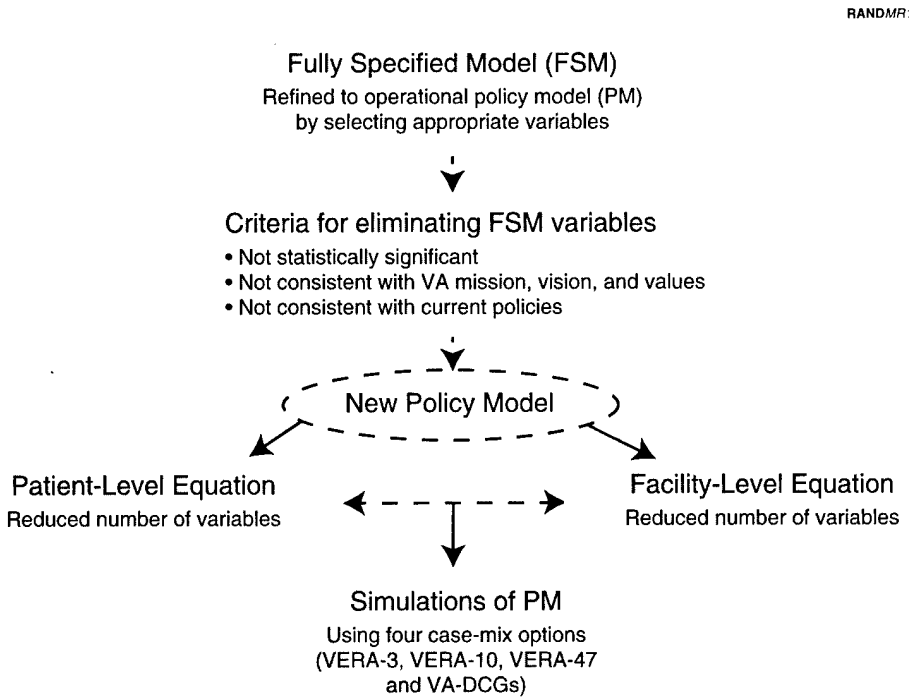

Figure 2.2—Overview of Construction of the Policy Model

The policy model, in contrast to the fully specified model, could be used to assess the implications of various policy changes on VISN allocations. For instance, the model could be used to assess how allocations would change if VERA allocations were adjusted based on elderly veterans' Medicare expenditures. In fact, because Medicare reliance among veterans is increasing as the veteran population ages, we have chosen to include a measure of Medicare use in our policy model, the results of which are reported in Chapter Three. Finally, in principle, the policy model could also be used as an allocation tool, replacing the current VERA system, which relies essentially on a set of national prices adjusted for differences in labor and selected non-labor costs.

Case-Mix Measures

One of the ways that VERA seeks to ensure that resources are allocated equitably is by adjusting for differences in the health status of patients within each VISN. As described in Chapter One, VERA currently adjusts for case mix by assigning patients to one of three categories—Complex Care, Basic Vested, and Basic Non-Vested—according to their level of health care use, basing capitation rates for each category on the expected costs of the care for patients in each of the three categories.

Considerable variability exists within each of the three categories with respect to actual patient costs. For example, in the Complex Care group, the national average cost for patients in the Domiciliary Patient Class [1] (i.e., patients receiving domiciliary care and meeting other criteria pertaining to long-term care utilization in the current fiscal year) in FY 2000 was $24,810, about $17,000 less than the $42,153 capitated payment for Complex Care. In contrast, the average cost for patients in the Transplant Patient Class (i.e., patients who received a heart, lung, bone marrow, kidney, or liver transplant in a VA facility within the past three fiscal years) was $78,211, about $36,000 more than the capitated payment (General Accounting Office, 2002). This variability penalizes networks that, through no fault of their own, have proportionately more transplant patients and rewards those that have proportionately more domiciliary patients.

One goal of our study was to determine whether VERA adequately adjusts for differences in case mix across the VISNs. To address this issue, we categorized patients using four different case-mix systems. We then estimated four patient-level cost models that were identical, with the exception of the case-mix system used to group patients:

VERA-3: the original three VERA categories.

VERA-10: a case-mix system with ten VERA categories.

VERA-47: a case-mix system with 47 VERA categories.

VA DCGs: VA-modified Diagnostic Cost Groups.

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[1] Domiciliary care is a type of care that amounts, essentially, to temporary lodging for ill or disabled veterans unable to be cared for at home.

We selected the VERA-3 case-mix adjustment measure because the VA has been using it; the remaining case-mix measures were chosen because the VA has been considering using them and because the data needed to assess their potential use were readily available. In preliminary analyses, we also considered models that included Hierarchical Condition Categories (HCCs), Resource Utilization Group II scores, and Global Assessment of Functioning scores. However, we dropped these measures from our analysis because they provided little improvement in explanatory power. We did not estimate models using other case-mix adjusters, such as Adjusted Clinical Groups (Weiner et al., 1998) and Resource Utilization Group III scores (Fries et al., 1994), because the data needed to implement them were not readily available.

VERA Patient Categories. The VA has established a hierarchy of 47 VERA patient categories[2] based on concepts of clinical appropriateness, policy decisions, and treatment resource requirements. Each person who enters the VA health care system is assigned to one of the 47 VERA patient categories based on the care he or she receives. Assignment to patient categories is based upon numerous data elements, including inpatient and outpatient *International Classification of Diseases, Ninth Edition, Clinical Modification* (ICD-9-CM) diagnostic codes, ICD-9-CM procedure codes, Current Procedural Terminology (CPT) codes, Resource Utilization Groups II scores, clinic stop numbers, bed specialty codes, and laboratory test results obtained from patient registries. Patients who qualify for more than one category are assigned to the highest category (in terms of expected resource use) for which they qualify.

The VA has also aggregated the 47 patient categories into 10 broader patient categories and then further combined these 10 into the three patient case-mix categories currently in use within VERA.

As we noted above, three of our patient-level equations incorporated the VERA-3, VERA-10, and VERA-47 categories, respectively, to control for the effect of case mix. Each of the three regression equations included one dichotomous variable for each VERA category except one, which served as the reference group (for example, the model that used VERA-10 included dichotomous variables for nine of the ten patient categories.) Appendix B shows how these three classification systems compare.

VA DCGs. Our fourth patient-level model used a modification of the DCG system to control for case mix. The HCC/DCGs system, a widely used case-mix adjustment approach developed by researchers at Boston University, uses approximately 15,000 ICD-9-CM diagnosis codes to classify patients into 545 clinically homogeneous groups called DxGroups. The DxGroups are further collapsed into clinically homogeneous condition categories (CCs) that require similar resources. To avoid double counting within a disease category, a hierarchy is established based on disease severity, so that patients are assigned only to the highest ranked CC (the HCC) among sets of related conditions. For example, a woman diagnosed with both breast cancer and secondary metastasis to the lung would be assigned to the metastatic cancer HCC but not to the breast cancer HCC. The number of times the ICD-9-CM

[2]Since the VA updates the list periodically, the number of categories at any given point in time may be slightly higher or lower than 47.

code is recorded throughout the year and the site of treatment (inpatient versus outpatient) do not affect assignment (Ash et al., 2000; Pope et al., 2000).

The VA has modified HCC/DCGs to reflect differences between the veteran population and the privately insured population, for which off-the-shelf HCC/DCG software is intended. Specifically, the VA combined 30 HCCs (those that are very uncommon in the VA population or do not predict significant positive costs) into one category and added 14 VERA category flags for special disability programs (e.g., spinal cord injury, traumatic brain injury, and serious mental illness). The VA then predicted the costs for each patient from the HCC model and assigned patients to one of 24 "VA DCG" categories based on their predicted costs (VHA Executive Decision Memo, 2001). In our DCG patient-level equation, one dichotomous variable was included for each VA DCG except the highest-cost VA DCG, which served as the reference group.

Predicting Patients' Costs

As indicated above, the patient and facility equations were used to generate a predicted annual cost for each VA patient in a given year. These predicted costs represent our best estimate of what each patient's costs would be *after controlling for the independent, or explanatory, variables included in the patient and facility regression equations*. Thus, predicted costs were determined by the set of variables included in the patient- and facility-level regression equations. We generated the predicted patient costs for each of the four case-mix measures described above and aggregated these costs to the VISN level.

DATA SOURCES

Our analyses relied on individual-, facility-, and county-level data. The individual-level data set was prepared by VHA's Allocation Resource Center (ARC), using a set of specifications supplied to the VA by RAND staff. The ARC data set contains information on the annual costs of treating patients at each VA facility, along with a host of socioeconomic, eligibility, cost, and health status variables. The cost measure included in the data set was taken from the VA's "Cost Distribution Report" and is based on individuals' VA health care use. The ARC assigns costs to patients according to the methodology described in its "Patient Costing Manual" (VA Allocation Resource Center, 2000).

In addition, the patient-level file contains information on individual Medicare "reliance," state-level Medicaid generosity, and county-level health care resources. Patient-level data on annual Medicare expenditures for users of the VA health system (which we refer to as "Medicare reliance") were available to RAND through agreements with the Centers for Medicare & Medicaid Services (CMS) and the VA's Management Science Group (MSG).

Individual-level data on Medicaid expenditures for patients in the VA health care system are not readily available. As a substitute, we created state-level measures of Medicaid generosity using data on state-level Medicaid expenditures and the number of poor adults in each state. The data on Medicaid expenditures came from the

Health Care Financing Administration (HCFA)-2082 reports (now collected as part of the Medicaid Statistical Information System, or MSIS). The data on the number of poor adults in a state were taken from the Kaiser Family Foundation web site (www.kff.org), which are based on estimates from the Census Bureau's Current Population Survey.

Information on the local (i.e., county-level) supply of physicians and hospital beds was obtained from the Area Resource File (ARF). The ARF data are produced annually by Quality Resource Systems, Inc., under contract to the Health Resources and Services Administration.

The majority of the data for the facility-level equations came from either the ARC or VA headquarters. Again, these files were constructed based on a set of specifications that RAND submitted to the VA. The facility-level file contains data on each facility's structural characteristics, costs, and staffing levels. We supplemented these data with information on state-level energy prices from the Department of Energy's State Energy Price Report and information on the rural or urban status of the location of the parent VA facility from the ARF.

We requested and received both individual and facility data for FY 1998 through 2001. However, because HCCs and VA DCGs were not available for 2001, we limited our analysis to data from the earlier fiscal years. Moreover, after testing the stability of the estimates over time, we chose to limit our analysis further to a single year of data. As such, the results presented in Chapter Three of this report are based on data from FY 2000, the most recent year for which data were available on all patient-level variables.

Because some veterans received care at more than one facility, we aggregated each veteran's costs across facilities to obtain one observation per person. Each facility in which the veteran received care in that year was assigned a weight in the analysis equal to the proportion of the total cost of the care they received at that facility.

DEPENDENT AND EXPLANATORY VARIABLES

In this section, we describe the dependent and explanatory variables that we used in the patient- and facility-level regression equations. As indicated previously, the same dependent variables were used in the fully specified and policy models. However, the fully specified model contained a larger set of explanatory variables than did the policy model.

Dependent Variables

The main focus of our analysis was on explaining how patient and facility characteristics affect the costs of providing health care to veterans. Consequently, the dependent variable used in our patient-level cost equation was the VA's annual cost of providing health care to the individual. The costs included all medical care costs (inpatient, outpatient, and long-term care), as well as education and research support costs, resident salaries, equipment costs, and NRM costs.

The dependent variable for the facility-level equations came from the independent variables in the patient-level cost equations that served as indicators for the 143 major facilities—generally, acute care hospitals—in the VA health care system.[3,4] By including these facility indicator variables in the patient-level regression equation, we were able to estimate the effect of being treated in a particular institution on each patient's costs. These facility-specific cost shifts provide information on the variation in costs across facilities if characteristics of the patients treated are held constant. These estimated cost shifts served as the dependent variable in the facility-level regression equations. More precisely, the facility-level equation was used to understand the degree to which the cost shifts attributable to facility differences can be explained systematically by the facility characteristics detailed below.

We note one issue that may be important for interpretation. To estimate the cost of medical care at the patient level, ARC begins with the total dollars per budget unit (e.g., total dollars in a Cost Distribution Report account) and then divides that amount by patient utilization within that account (e.g., number of inpatient days) to arrive at an estimate of the cost per unit of utilization (e.g., cost per day of hospitalization) (VA Allocation Resource Center, 2000). Each patient's utilization is then tabulated and assigned costs so that patient-level costs can be estimated. This method ensures that the dollar cost of the relevant VA unit equals the ARC-estimated costs of utilization within that unit. However, the budget of a VA unit is not necessarily identical to the economic costs of producing the medical care products and services that were used by VA patients within that unit. As a result, our dependent variable can be thought of most appropriately as being derived from relative value weights for the underlying health care used by VA patients, rather than as estimates of the absolute economic cost of production.

Explanatory Variables

Table 2.1 (previously shown) lists the explanatory variables used in both the patient- and facility-level regression equations. The table also shows which variables are included in the fully specified and policy models. At the outset, we included 17 categories of variables in the fully specified patient-level equation and 22 categories in the fully specified facility-level equation. After we deleted variables that failed one or more of the criteria for inclusion in the policy model, 11 variable categories remained in the patient-level regression model, and 9 remained in facility-level regressions.

It is important to note, as indicated previously, that we assessed the potential effects of various case-mix measures across facilities by running the fully specified and policy models using four different case-mix measures. However, these case-mix mea-

[3]Our count of the number of VA facilities reflects a wave of recent management consolidations. The VA health care system contains more than 143 major physical structures, but these structures are organized into only 143 management units. In addition to the 143 facilities, the VA has over 450 outpatient clinics. However, each clinic reports through a major facility that is ultimately responsible for how each patient's care is managed.

[4]Technically, indicator variables for only 142 facilities were included in the equation because one facility served as the reference category.

sures were not included in the facility-level regression equations; rather, they were included in the individual-level equations, which, in turn, produced the facility-specific cost shifts that the facility equations attempt to explain.

Description of Selected Variables in the Regression Equations

Many of the variables included in the patient- and facility-level regressions are straightforward and do not warrant discussion (e.g., age, race/ethnicity, sex). However, some of the variables require more-detailed descriptions.

Patient-Level Equation. The patient-level equation contains two measures of county-level health care resources: hospital beds and physicians per capita. These measures were taken from the ARF and were matched to individual veterans based on their home zip code. Similarly, the measures of distance to the facility at which the individual was treated and to the closest CBOC were calculated using the home zip code of the individual and the zip code of the facility or CBOC.[5] We used these variables to explore whether the availability of other health care resources in the county in which the veteran resides and the distance the veteran must travel to receive VHA services affect the amount of care the veteran obtains from VHA facilities.

Medicare reliance was measured as the percentage of total health care costs (Medicare payments, including beneficiary cost-sharing amounts, plus VA costs) that is covered by Medicare. A person is said to be more reliant on Medicare as this percentage increases. In addition, in the fully specified model, the patient-level equation includes two measures of state Medicaid generosity. To obtain measures of generosity that are relevant for the VA population, we first created a general measure that is based on state-level Medicaid expenditures on recipients who are eligible for coverage because they are elderly, blind, or disabled. To incorporate information about a state's breadth of coverage, we scaled the expenditures by the number of poor adults (age 18 and over) in the state. The resulting measure (expenditures per poor adult) incorporates both aspects of program generosity: spending and eligibility. The second measure of Medicaid generosity has the same basic characteristics but focuses specifically on long-term care. In this case, the measure was calculated as state-level Medicaid expenditures on long-term care for each poor elderly adult (age 65 and over).

The facility variables in the patient-level regression indicate the facilities where an individual was treated. The facility indicators take values between zero and one and measure the percentage of an individual's total annual VA costs that were incurred at each facility. Approximately 80 percent of veterans in the data set were seen at only one facility during the year. For these individuals, the indicator variable for the facility where they received treatment had a value of one, and all other facility indicators were zero. Similarly, veterans who were treated at multiple locations had multiple facility variables (the number coinciding with the number of facilities at which they

[5]The distance is calculated from the center of the home zip code to the center of the facility's zip code. The precise methodology used to calculate these distances came from Meridian World Data and is described on its web site (www.meridianworlddata.com/HTML9/distance-calculate-2.asp).

were treated), each taking values greater than zero and less than one. Since the value of the facility variables for an individual is based on the share of total costs incurred at each facility, the sum across all these variables for an individual will equal one.[6]

Facility-Level Equation. In the facility-level regression equations, the VA labor index is a VISN-level variable generated by the VA to measure the difference in wages across geographic areas. The VA labor index is used to adjust allocations in the current system.

The facility-level equation also includes a measure of the average physical condition of the buildings at the facility. It is measured on a scale of 1 to 5, with higher scores indicating better physical condition. These data were taken from the VA's "Capital Asset Baseline Assessment."

Also included in the facility-level equation are several variables aimed at measuring medical education and research activity related to academic affiliations, based on the findings from our review of the literature (see Phase I report, Wasserman et al., 2001). Education costs can be measured in a number of ways. To look at direct costs, one could use a categorical variable for the number of residents per facility to test whether costs might vary by residency program size. To assess the impact of teaching on the provision of patient care services by teaching physicians, one could construct a variable based on the ratio of residents to physicians per facility. This variable would measure the intensity of physician involvement in teaching activities (that is, the higher the resident to physician ratio (or the more residents per physician), the more involved physicians are in teaching activities) and would account for the net impact of residents on physician productivity. While teaching activities reduce the time teaching physicians can devote to patient care activities, residents also provide patient care. When we tested these two different measures of medical education programs, we found that the intensity measure had more explanatory power. Thus, we selected that variable for inclusion in the regression equations. Finally, we constructed two variables to measure research intensity. One measured total research costs per 1,000 unique patients; the other was expressed as the percentage of funded research that took place at each facility.

DATA CLEANING AND IMPUTATION

In this section, we describe the steps we took to clean and prepare the data for analysis.

Individual Data

In general, the data that were obtained for the patient-level analysis were complete, clean, and deemed reliable. However, for some variables, missing data were a problem. When possible, we used information from other years or other observations on

[6]The facility variables incorporated are very similar to the prorated patient (or PRP) calculations that the VA currently uses in its methodology for counting workload.

the same person within the same year to logically impute values for the missing variables. This method was used in cases where the variable value for an individual would be unlikely to change over time (e.g., sex and race) or would change in a predictable fashion (e.g., age).[7] In cases where we were unable to logically impute a value for the variable, it was coded as missing. In the patient-level regressions, all variables were entered into the equation categorically rather than as continuous variables.[8] This methodology allows the missing values to be coded as such and to be included in the analysis.

Data on individual-level Medicare expenditures were needed to generate the measure of Medicare reliance used in the patient-level equation. Unfortunately, expenditure information is not available for individuals who are enrolled in Medicare managed-care HMO (Medicare+Choice) plans. However, for such individuals, the data do indicate the number of months the individual was enrolled. We used this information, as well as information on the VA facility (or facilities) where the person was treated, to impute a Medicare expenditure for people in Medicare+Choice plans.[9] A timing issue also arises in the calculation of Medicare reliance. The most recent Medicare expenditure data that were available to us were from FY 1999. As such, the FY 1999 data on Medicare expenditures (including the imputed values for the HMO enrollees) were brought forward to use in our cost equations for FY 2000.[10] We inflated the FY 1999 Medicare expenditures into 2000 dollars using the Medical Care Consumer Price Index (CPI) to make them comparable with the VA cost data. In addition, we imputed Medicare expenditures for those individuals who are Medicare eligible (age 65 and over), but for whom we have no Medicare expenditure data in FY 1999.[11] This group consisted primarily of individuals who became Medicare eligible during FY 2000. Because we did not have any information on the number of months the newly eligible were enrolled, we imputed six months of Medicare costs for this group.

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[7]For example, if information on sex was missing for an individual in the FY 2000 data, we looked at data for FY 1998, FY 1999, and FY 2001 to see if sex was reported in another year. If data for another year had information on the individual's sex, then we assigned that information to the FY 2000 observation. This sort of logical imputation is particularly useful for variables such as sex that we would not expect to change over time.

[8]For example, instead of entering an individual's age into the model directly, we generated a set of indicator variables representing different age groups (e.g., less than 25 years of age, 25–34, 35–44, etc.). These indicator variables take the value of 1 if the individual falls into that age category and 0 otherwise. Each person will fall into only one age category. When entering the variables in this fashion, we can include an additional category for those individuals for whom the age variable is missing.

[9]The imputation procedure assigns the facility-specific average fee-for-service Medicare expenditure to individuals treated at that VA facility and who were enrolled in Medicare HMOs. The average is scaled to reflect the number of months the individual was enrolled in the HMO.

[10]In doing so, we have implicitly assumed that Medicare reliance is stable over time, at least in the short run.

[11]For these imputations, facility-specific average expenditures (based on fee-for-service clients) were assigned to individuals for whom no FY 1999 Medicare information exists.

Facility Data

The data that were obtained to estimate the facility-level regression equations came from a wide array of sources within the VA. While individual data elements were relatively clean and complete, combining the data elements was difficult. The problem stems primarily from recent management consolidations, which led to facility information being reported at different levels in different systems. For example, much of the information on facility infrastructure was measured in FY 2001 and reflected the consolidation of facilities. However, the data on costs and staffing patterns still include information for individual facilities that have since been consolidated.[12] Moreover, the patient-level data show people being treated in these facilities. As such, we spent a great deal of time going through the facility data and aggregating them (or disaggregating them in some cases) to generate data for a consistent set of facilities. In cases where facilities were missing some data elements, we assigned the median value for that variable across all facilities.

STATISTICAL TECHNIQUES

The overall goal of the analyses was to evaluate the potential impact on health care costs of various patient- and facility-level characteristics. To this end, we implemented a two-step regression procedure. The first step in our analysis was to estimate a patient-level multivariate equation of annual VA health care costs:

$$C_i = X_i'\beta_1 + H_i'\beta_2 + A_i'\beta_3 + L_i'\beta_4 + W_i'\theta + \varepsilon_i \quad (1)$$

where

C_i is equal to the total annual costs for veteran i;

X_i is a vector of sociodemographic variables for veteran i;

H_i is a vector of health status (or case mix) variables for veteran i;

A_i is a vector of availability of local health care resources (that is, physicians and hospital beds) for veteran i;

L_i is a vector of geographic location variables for veteran i;

W_i is a vector of VA facility variables indicating the percentage of veteran i's annual costs that were incurred at each facility;

ε_i is an error term that is independently and identically distributed (i.i.d.)$(0,s^2)$; and

$\beta_1 - \beta_4$ and θ are parameters to be estimated.

In general, annual health care costs have a very skewed distribution (i.e., a large number of patients with low costs and a long right tail representing a small number

[12] In most cases, the consolidation reflects only a change in management organization and does not indicate that the consolidated facility has been closed.

of patients with very high costs), and the VA data are no exception. When this skewness occurs, standard linear regression using the dollar value of annual costs as the dependent variable may not fit the data very well. As an alternative, researchers often use alternative specifications such as ordinary least squares (OLS) regression with a log or square root transformation of the dependent variable or gamma regression with a log link (Manning and Mullahy, 2001).

For the present analyses, however, we have chosen to use standard, OLS regression models, in the interests of simplicity, transparency, and consistency.[13] One of the goals of the VERA system is for the allocation framework to be simple and predictable. We have developed our analytic strategy with this goal in mind. Models with log or square root transformations, and gamma regressions, are more complicated than the linear model, and the results from these specifications are more difficult to interpret directly. Moreover, the linear specification is used in much of the existing literature on risk adjustment. This consistency with the previous literature is desirable because it provides the context for the interpretation of our results.

The parameter estimates associated with the facility indicator variables in the patient-level regression equations reflected the cost associated with being treated at a particular facility after controlling for all observable individual characteristics. These estimated facility cost shifts set up the second step in our empirical analysis. In this step, we sought to explain the variation in these facility cost shifts using facility-level characteristics. In these regression equations, the estimated coefficient of a particular characteristic measures its association, on average, with a shift in annual costs. This equation has the following general form:

$$\hat{\theta}_j = L_j'\delta_1 + S_j'\delta_2 + P_j'\delta_3 + I_j'\delta_4 + M_j'\delta_5 + R_j'\delta_6 + E_j'\delta_7 + v_j \quad (2)$$

where

$\hat{\theta}_j$ are the estimated facility-specific average shifts in annual costs, based on the results of the patient-level equation;

L_j is a vector of geographic location-related measures for facility j;

S_j is a vector of medical school affiliation measures for facility j;

P_j is a vector of labor and non-labor prices or costs for facility j;

I_j is a vector of measures of the physical plant/infrastructure for facility j;

[13] We recognize that a trade-off may exist between transparency/simplicity and selecting the functional form for the regression equations that provides the best "fit." However, a paper by Wagner, Chen, and Barnett (forthcoming) supports our choice to use the linear model. Using data on veterans 65 and over, they found that while the log transform helped reduce the appearance of skewness, the OLS model consistently performed better than models with logged cost-adjusted charges as the dependent variable. They found, for instance, that when they compared the OLS and semi-log models, the OLS model had substantially lower absolute mean error. Citing an article by Lipscomb et al., 1998, they argued that the ability to predict costs should be the primary concern when choosing the appropriate statistical model. This argument is particularly relevant given one of the main objectives of our study, that is, to aggregate predicted costs and assess how VISN allocations change.

M_j is a vector of consolidation-related measures for facility j;

R_j is a vector of research- and education-related measures for facility j;

E_j is a vector of efficiency-related measures for facility j;

v_j is an error term that is i.i.d.$(0,s^2)$; and

$\delta_1 - \delta_7$ are parameters to be estimated.

We also estimated the facility-level equations using OLS regression.

The first and second stages of the estimation were linked. The facility cost shifts that serve as the dependent variable in the second stage equation were estimated in the patient-level equation. As a result, a separate set of facility cost shifts was estimated for each specification of the patient-level regression, and thus, a separate set of facility-level results is generated. Therefore, changes in the specification of individual-level equations could lead to changes in the estimates of the impact of facility-level characteristics on the facility cost shifts, even if the specification of the facility-level equation does not change. For example, the estimated impact of academic affiliations in the second stage could vary depending on the specific set of health status measures used in the first stage.

The estimates from the regression equations identify the factors, both patient- and facility-level, that have a significant impact on costs. However, these estimates do not directly address the question of how VISN allocations would be changed if these variables were considered in VERA. To address this question, we used the regression estimates to simulate VERA allocations to VISNs under various scenarios.

The first step in the simulation process was to generate predicted annual costs at the patient level. To do this, we worked backwards through the estimation process and started with the facility-level regression, where the estimated coefficients were used to predict facility cost shifts. The predicted cost shifts were then used in combination with the patient-level parameter coefficient estimates to generate predicted annual costs for each individual veteran. The empirical implementation of this process is illustrated in Equations 3 and 4. Patient-level annual predicted costs are given by the following

$$\hat{C}_i = X_i'\hat{\beta}_1 + H_i'\hat{\beta}_2 + A_i'\hat{\beta}_3 + L_i'\hat{\beta}_4 + W_i'\overline{(\hat{\theta})} \tag{3}$$

where the symbol "^" represents an estimated coefficient and $\overline{(\hat{\theta})}$ is a vector of predicted facility cost shifts determined by the following equation.

$$\overline{(\hat{\theta})}_j = L_j'\hat{\delta}_1 + S_j'\hat{\delta}_2 + P_j'\hat{\delta}_3 + I_j'\hat{\delta}_4 + M_j'\hat{\delta}_5 + R_j'\hat{\delta}_6 + E_j'\hat{\delta}_7 \tag{4}$$

The predictions are based only on the variables included in the equation. Thus, unobserved factors such as efficiency and quality of care are not directly taken into account. The same is true for predictions based on the policy model, where some variables are excluded based on the criteria that were outlined previously. In this case,

the predicted costs generated from the policy model directly take into account only those factors that are consistent with the VA's mission and current policy.[14]

The second step in the simulation process involved aggregating the predicted patient-level costs to the VISN level. Because some veterans incur costs in multiple VISNs during the year, we broke out each individual's annual predicted cost across facilities based on the share of actual costs that were incurred by that individual at each facility. This allowed predicted costs to be aggregated to the facility and VISN levels. The VISN-level aggregate can be interpreted as an estimate of the costs the VISN would be expected to incur based on the characteristics of the individuals the VISN treats and the characteristics of the facilities.

The VISN-level predicted costs could then be used to generate a simulated allocation for any lump-sum appropriation. To do this, we used the VISN-level predicted costs to calculate the proportion of total predicted costs incurred by each VISN. The share estimates can then be applied to any given appropriation to derive the associated VISN-level VERA allocations. The calculation of the simulated allocation for a particular VISN is illustrated in Equation 5.

$$\textit{Allocation for VISN}_i = \frac{\text{Predicted Cost for VISN}_i}{\sum_{i=1}^{22} \text{Predicted Cost for VISN}_i} * \left(\text{Appropriation}\right) \tag{5}$$

To interpret the simulation results, it is useful to have a basis of comparison, or benchmark allocation, against which each simulation can be judged. The actual FY 2002 allocation is perhaps the most obvious benchmark. However, the comparison between the simulated allocations and the actual FY 2002 allocations confounds two different effects: (1) the difference in methodology (regression versus workload counts and national prices) for determining the allocations and (2) the difference in the patient- and facility-level characteristics that are included in the models. In an effort to separate out these two effects, we made three different comparisons. First, we developed a "base case" regression equation that includes only variables that are currently considered in the VERA methodology: the three VERA patient categories, the labor index, research costs, and education costs. The results from these regressions were then used to simulate a base case allocation for each VISN. Because the base case model includes only variables that are used in the current VERA system, the comparison between the base case and actual FY 2002 allocations isolates the difference that is due to the methodology used.

The second type of comparison we made was between the simulated base case allocations and the simulated VERA-3 policy model allocations. These comparisons

[14]However, if variables that are omitted from the regression are correlated with both the dependent variable and one or more of the included covariates, the estimated coefficients for the included covariates will be biased. In other words, the coefficient estimates will pick up some of the effects of the excluded variables. As such, the policy model may indirectly take into account some characteristics not included in the model.

show the impact of the additional patient and facility variables that we controlled for in our regression equations, using the same case-mix variables.

The third set of comparisons was designed to isolate the effect of the alternative case-mix measures on VISN-allocations. Here we compared the VERA-3 policy model simulations to those based on the VERA-10, VERA-47, and VA DCG case-mix specifications. Since the case-mix measure that is used represents the only difference among these models, the results of these comparisons will illustrate the effect of the alternative case-mix measures on VISN allocations.

SENSITIVITY ANALYSES

In addition to using the four case-mix measures described above, we conducted a number of analyses to determine how sensitive our findings were to alternative data and model specifications.

First, while our analysis relied largely on patient-level data from the year 2000, we also estimated the patient-level equations using data from 1999.

Second, we used alternative measures of each patient's total annual treatment costs as the dependent variable in the patient-level regression equations. As indicated previously, the person-level cost data used in the primary analysis came from the ARC. However, the VA has recently decided to rely on its Decision Support System (DSS) database for budgetary and management purposes. Because significant differences exist in the ways in which ARC and DSS estimate patients' costs, we tested whether our regression and simulation results would be sensitive to these cost allocation differences.[15] We further tested the sensitivity of our results to changes in the ways in which costs are allocated to patients by using patient-level cost data provided by the VA's Health Economics Resource Center (HERC).[16] In conducting the

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[15]ARC estimates patient-level annual costs from data in the Cost Distribution Report (CDR), Outpatient Clinic File (OPC), Patient Treatment File (PTF), and other sources. A limitation of the ARC methodology is that it does not estimate the cost of individual health care encounters. Per diem inpatient costs, for example, are estimated based on the total dollars per CDR account divided by the total bed days of care for each bed service (VA Allocation Resource Center, 2000); the total per diem costs for a particular veteran over the course of a fiscal year are estimated by summing up the per diem costs from different bed services. As Barnett (under review) notes, this approach assumes "that the cost of medical surgical days is proportional to the length of stay; information on the relative cost associated with [each] DRG [Diagnosis Related Group] is not employed."

ARC allocates trainee, education, research support, and other indirect costs to patients "on a per diem basis for inpatient-related accounts and on a cost per Clinic Stop basis for outpatient-related accounts" (VA Allocation Resource Center, 2000).

[16]In contrast to ARC, HERC estimates the cost of each health care encounter, then sums them up to obtain an estimate of the cost of each patient in each fiscal year. As summarized by Barnett (under review),

> The cost of acute medical and surgical care was estimated using measures of relative value estimated from a cost-function created from Veterans' stays in Medicare hospitals (Wagner et al., 2002 [under review]). The cost of long-term care was based on estimates of the relative resource use associated with case-mix measures from periodic assessment of VA long-term care patients (Yu et al., 2002). The cost of outpatient visits was estimated using the payments from Medicare and other payers as a measure of relative value (Phibbs et al., 2002 [under review]).

cost allocation sensitivity analysis, we created a subset of the patient-level data set that included only those patients who received care at a single VA facility during FY 2000, which amounted to roughly 80 percent of the patients. Limiting the sample in this way provided a reasonable test of the sensitivity of our results, while circumventing the time-consuming effort that would have been required to account properly for patients treated at multiple facilities under the DSS and HERC cost allocation methods.

Finally, to test the sensitivity of our results to the veteran population used in the analysis, we estimated the patient- and facility-level equations after including all Priority 7 patients. We initially excluded the Basic Care Priority 7 patients from our analysis, because they are excluded from VERA workload calculations. However, we were interested in assessing the extent to which the patient and facility equations' parameter estimates and the simulated VISN allocations changed if these patients were included in the analysis.

Like HERC, DSS estimates the cost of individual health care encounters. However, the DSS methodology is quite different from HERC's. The HERC web site (www.herc.research.med.va.gov, 2002) summarizes the DSS methodology as follows:

> DSS extracts costs from the VA payroll and general ledger. These are assigned to departments based on periodic reports made by managers, who assign costs of the six categories of expense to departments. Some sites use time reports and accounting data instead of managerial reports to assign costs to departments. The calculation of department costs from the managerial estimates, payroll, and general ledger data is done by the DSS program called the Account Level Budgeter (ALB). Overhead (the cost of departments that do not produce patient care) is distributed to patient care departments using a step-down method. Direct cost or the number of square feet of occupied space are used as the basis of the distribution. Costs of intermediate products are then determined. Examples of intermediate products are a chest x-ray, a unit of blood, a 15-minute clinic visit, or a day of stay in the intensive care unit. They are called intermediate products to distinguish them from the final product, a patient encounter, which is a bundle of intermediate products.
>
> Both DSS and HERC "normalize" cost estimates to the VA's cost allocation system. That is, costs are multiplied by a constant factor so that, when aggregated, the dollar costs across patients sum to the relevant VA budget allocation. Because the VA budget allocation is not necessarily identical to the aggregate economic cost of producing the medical care products and services that were used by VA patients, the DSS and HERC estimates, like the ARC cost estimate, should be thought of as being derived from relative value weights for the underlying health care used by VA beneficiaries, rather than as estimates of the absolute economic cost of production.

Chapter Three

RESULTS

This chapter describes the results of our analyses to account for the patient and facility characteristics that influence the VA's patient care costs. These results were generated by applying the regression analysis techniques described in the preceding chapter. Additionally, the chapter presents the results of simulations, based on the regression models, of how VISN allocations would change if VERA incorporated various factors that affect patient care costs but that it currently omits. In this chapter, we have focused our discussion on the set of results that we believe to be most relevant for policy purposes. Complete findings from both the regression and simulation analyses are contained in Appendix D.

REGRESSION RESULTS

In this section, we summarize the results from the patient- and facility-level regression models. We focus our discussion on the results from the policy model; however, we also include a brief discussion of the key differences between the results of the policy model and those of the fully specified model.

As noted in the previous chapter, we restricted the sample in our primary analysis to those veterans who are funded via the current VERA allocation methodology. Specifically, the primary analysis sample excludes Priority 7 veterans who are in the Basic Care patient categories that are currently excluded from VERA workload estimates and patients who are not veterans, such as non-veteran employees. The final sample for FY 2000 includes 3,000,563 veterans.

Descriptive statistics are presented in Table 3.1. Approximately 44 percent of the sample is 65 years of age or older, 95 percent is male, 52 percent is married, and 59 percent reported an annual income of $20,000 or less. However, the income data must be interpreted with caution, because the data are based on voluntary self-reports and are missing for 13 percent of the sample. Missing data are also an issue for a number of the demographic variables. For example, we do not have information on race for 32 percent of the sample or on marital status for 5 percent. Again, these data are based on self-reports, and the information is not required for treatment within the system. A plurality of veterans (48 percent) is in Priority Group 5 (see Table 1.1 for definitions of patient priority groups). Priority Groups 1 and 3 are the second

Table 3.1

Patient- and Facility-Level Descriptive Statistics

Patient-level Variables, N=3,000,563			
Variable Category		**Mean**	**Std Dev**
Age			
	Missing	0.016	0.125
	Less than 25	0.008	0.089
	25-34	0.046	0.210
	35-44	0.101	0.301
	45-54	0.225	0.417
	55-64	0.162	0.369
	65-74	0.231	0.422
	75-84	0.192	0.394
	85 and over	0.019	0.136
Income			
	Missing	0.133	0.340
	$20,000 or less	0.589	0.492
	$21,000 - $40,000	0.220	0.414
	$41,000 - $60,000	0.035	0.184
	$61,000 - $80,000	0.011	0.105
	More than $80,000	0.013	0.112
Race			
	Missing	0.318	0.466
	Hispanic	0.042	0.201
	American Indian	0.003	0.051
	Black	0.124	0.330
	Asian	0.005	0.067
	White	0.508	0.500
Sex			
	Missing	0.000	0.018
	Female	0.049	0.215
	Male	0.951	0.216
Marital Status			
	Missing	0.052	0.222
	Single	0.429	0.495
	Married	0.519	0.500

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Table 3.1—continued

Patient-level Variables, N=3,000,563			
Variable Category		**Mean**	**Std Dev**
Physicians per Capita			
	Missing	0.005	0.071
	Less than 0.001	0.251	0.434
	0.001 to 0.002	0.239	0.426
	0.0021 to 0.003	0.248	0.432
	Greater than 0.003	0.257	0.437
Hospital Beds per Capita			
	Less than 0.003	0.414	0.493
	0.003 to 0.006	0.427	0.495
	Greater than 0.006	0.154	0.361
Rural/Urban Status of Patient's Residence			
	Missing	0.704	0.457
	Urban	0.158	0.364
	Suburban	0.068	0.252
	Rural	0.026	0.159
	Very Rural	0.044	0.206
Distance to Closest Facility			
	Missing	0.021	0.144
	Less than 30 miles	0.491	0.500
	31 to 100 miles	0.369	0.483
	101 to 250 miles	0.112	0.315
	Greater than 250 miles	0.007	0.084
Distance to Closest CBOC			
	Missing	0.005	0.072
	Less than 30 miles	0.697	0.460
	31 to 100 miles	0.296	0.457
	Greater than 100 miles	0.002	0.044
Priority Group			
	Missing	0.000	0.008
	Priority 1	0.152	0.359
	Priority 2	0.091	0.287
	Priority 3	0.150	0.357
	Priority 4	0.048	0.213
	Priority 5	0.480	0.500
	Priority 6	0.013	0.112
	Priority 7	0.067	0.249

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Table 3.1—continued

Patient-level Variables, N=3,000,563			
Variable Category		**Mean**	**Std Dev**
Medicare Reliance			
	Missing	0.557	0.497
	None	0.150	0.357
	1 to 24%	0.091	0.288
	25 to 49%	0.044	0.206
	50 to 75%	0.052	0.222
	75 to 100%	0.106	0.308
Medicare Imputation Indicator		0.059	0.263
Medicaid Generosity General			
	Missing	0.022	0.146
	First Quartile (lowest)	0.279	0.449
	Second Quartile	0.226	0.418
	Third Quartile	0.243	0.429
	Fourth Quartile (highest)	0.230	0.421
Medicaid Generosity Long-term Care			
	First Quartile (lowest)	0.195	0.396
	Second Quartile	0.323	0.468
	Third Quartile	0.233	0.422
	Fourth Quartile (highest)	0.228	0.420
Facility-level Variables, N=143			
Rural/Urban Status of Facility			
	Urban	0.832	0.375
	Suburban	0.119	0.325
	Rural	0.035	0.184
	Very Rural	0.014	0.118
Residents per Full-time MD		0.615	0.477
VA Labor Index		0.999	0.040
Average Food Cost per Bed Day		6.378	3.554
Energy Price (dollars per million BTUs)		8.659	1.296
Contract Labor Costs (percent of total labor costs)		0.054	0.029
Square Feet of Building Space per Acre of Land		19.365	26.932
Square Feet of Building Space per Unique Patient		36.348	21.415
Research Costs per 1000 Unique Patients		62,966.6	87,998.3
Percent of Funded Research		0.007	0.011
Average Building Age as of 2001		44.047	16.834
Average Building Condition (scale of 1-5)		3.298	0.600
Leased Square Feet per Patient		0.902	1.325
Ratio of Historic to Total Number of Buildings		0.216	0.255
Total Number of Buildings		34.720	30.779
Indicator for Recent Facility/Management Consolidation		0.154	0.362
Occupancy Rate		0.787	0.161
Number of CBOCs per 1000 Unique Patients		0.160	0.148
Direct Patient Care FTEs per 1000 Unique Patients		9.464	2.971
Non-patient Care FTEs per 1000 Unique Patients		32.934	10.772
LTC Beds per 1000 Unique Patients		6.592	9.517
Special Program Beds per 1000 Unique Patients		0.253	0.666

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and third largest groups, each with about 15 percent of the sample. Priority Group 7 is relatively small because our sample includes only those Priority 7 veterans who are currently included in VERA workload estimates.

The descriptive statistics illustrate some of the issues associated with the measurement and imputation of Medicare reliance at the patient level. First, the Medicare reliance variable is missing for a large proportion of the population. The missing data are largely the result of the fact that approximately 55 percent of the sample is not eligible for Medicare because of their age (i.e., they are under 65 years of age). In addition to the age ineligible, people in the missing category include those who are over age 65 for whom the Medicare data were missing. The imputation indicator shows that approximately six percent of the population were enrolled in a Medicare managed care plan. Cost data are not available for individuals in Medicare HMOs; thus, we imputed costs for these people based on the VA facility at which they were treated.

At the facility level, the descriptive results show that the large majority (83 percent) of the parent facilities are located in urban areas. With respect to infrastructure, on average, facilities have 35 buildings with an average age of 44 years. Moreover, the buildings are in average physical condition (average score of 3.3 on a scale of 1 to 5 with 5 being the best), and 22 percent have historical significance.

We have also tabulated descriptive statistics at the VISN level, which are shown in Appendix C. Because many of the patient- and facility-level variables used in the analysis differ across VISNs, we believed it was important to include a reference table of VISN-level descriptive statistics in the report. The table may provide a context for understanding the policy model simulation results described later in the chapter.

Patient-Level Results

Table 3.2 shows the proportion of variation (i.e., R-squared statistics) in annual VA patient care costs that is explained by each of the patient-level regression equations, ranging from a low of 0.25 for the base case regression equation to a high of 0.51 in the policy model that uses the VA DCGs as the case-mix measure.[1] We recognize that maximizing the explanatory power of the regression equation is not necessarily policymakers' only goal; other factors, such as simplicity, transparency, stability, and acceptability are also important. These issues informed our selection of the variables included in the policy model and ultimately our policy recommendations, as described in Chapter Four.

Selected parameter estimates and *t*-statistics from each of the five regression equations are presented in Table 3.2; the complete results are contained in Appendix

[1]The R-squareds from our individual-level equations are lower than those reported by the VA Management Science Group in its work on risk adjustment. The difference in the explanatory power of the equations is the result of several differences between our regression models and theirs. Most importantly, we did not impose any reinsurance cutoffs on the cost data.

Table D.1. Most parameter estimates are statistically distinguishable from zero at $p < 0.05$, a result that is not surprising given the very large sample size.

As we discussed in Chapter Two, all of the variables in the patient-level equations were defined as categorical variables. When a set of mutually exclusive categorical variables is used in a regression, the indicator for one of the categories must be excluded as a reference. As such, in looking at the results in Table 3.2, the coefficients on the categorical variables must be interpreted in reference to the category that was excluded from the equation. For example, when looking at the effect of age on cost, the equation includes indicators for whether the individual falls into a given age range (<25, 25 to 34, 35 to 44, 45 to 54, 55 to 64, 65 to 74, 75 to 84, 85 and over, or age missing). In this case, the excluded category is made up of people age 85 and older. As a result, the coefficients on the other age indicators are interpreted as the relative cost difference between that particular group and the 85 and over age group. Thus, a negative coefficient on the youngest age group indicates that this group is less costly to treat than the group of patients 85 years of age and older, after controlling for the effects of all the other factors in the regression model. Similarly, a positive coefficient would indicate that a group is more expensive than the reference group. The reference category for each set of categorical variables is noted in Table 3.2.

In the regression equations that use VERA patient classifications to adjust for case mix (VERA-3, VERA-10, and VERA-47), older patients appear to have higher VA patient care costs. However, in the DCG equations, higher age is not always associated with higher VA patient care costs, with veterans between the ages of 55 and 64 incurring the highest costs. Moreover, the veterans age 85 and older are the least costly in the VA DCG model. This finding is similar to previous non-VA studies showing that extremely old patients (e.g., 95 years and up) have lower costs than slightly less-old patients (e.g., 90–94 years) (Ash et al., 2000; Pope et al., 2000). Across all case-mix specifications, VA patient care costs are higher for women than for men. By comparison, previous non-VA studies indicate that young women have higher costs than young men, while elderly women have lower costs than do elderly men (Ash et al., 2000; Pope et al., 2000).

The coefficient estimates on the measures of geographic location indicate that veterans living in urban and suburban areas tend to have higher VA patient care costs than veterans living in rural areas. This trend can be seen directly in the estimates on the measure of rural or urban status. It is also reflected in the estimates of the impact of the supply of other health care resources in the area. Veterans living in areas with a greater concentration of physicians and hospital beds, which is generally true for urban areas, tend to have higher VA patient care costs. The higher costs of patients living in urban and suburban areas relative to those of patients living in rural areas are consistent with numerous non-VA studies (Welch, 1989; Goldman et al., 1997). Perhaps surprisingly, an individual's use of VA resources tends to increase as his or her distance to the VA health care facility increases.

The measures of reliance on Medicare and generosity of state Medicaid programs have the expected impact: Veterans who are more reliant on Medicare use fewer VA resources than other veterans, and veterans who live in states that are relatively gen-

erous in their coverage of long-term care tend to use fewer VA resources. Finally, the case-mix and facility indicator variables included in each of the equations are typically highly significant (see Appendix Table D.1 for a complete list of the coefficients and *t*-statistics for the patient-level models).

While the direction (sign) and significance of the coefficient estimates on the patient-level characteristics other than case mix are relatively similar across the case-mix specifications, the magnitudes vary. The primary differences are found between the VA DCG equation and the equations that use case-mix measures based on the VERA patient classification system. In general, the coefficient estimates from the VA DCG equation are smaller in absolute value than the estimates from the other equations. We believe that this result indicates that the VA DCG case-mix measure, because it is more refined, picks up differences in health status that were being layered onto other variables, such as age, under the VA patient classification-based case-mix measures.

Comparison with the Fully Specified Patient-Level Equation

The estimated coefficients on the variables that are included in both the fully specified and policy models are largely consistent in terms of the sign and significance of the effects, although the magnitude of the coefficients on particular variables in the sets of models varies to some degree. Moreover, the explanatory power of the regression equation is not improved substantially by the inclusion of the additional variables. Across the four case-mix specifications, the percentage of variation in costs explained by the model is approximately one percentage point higher in the fully specified equation than in the policy equation. The results from the fully specified patient-level equation can be found in Appendix Table D.2.

Several findings from the fully specified model are of interest. Consistent with prior studies on cardiac procedures (e.g., Whittle et al., 1993; Mirvis et al., 1994), we found that veterans who are members of minority racial/ethnic groups tend to have lower VA patient care costs than do white veterans. We also found that unmarried veterans tend to have higher patient care costs than do their married counterparts.[2] Also, not surprisingly, Priority 1 veterans (those with service-connected disabilities rated 50 percent or more) and Priority 4 veterans (those who are receiving aid and attendance or housebound benefits or who have been determined by VA to be catastrophically disabled) generally had higher patient care costs than do patients in the other priority groups.

Facility-Level Results

We estimated the facility-level equation to determine the extent to which inter-facility cost variation can be explained by factors such as the facilities' structural charac-

[2]This finding is consistent with anecdotes we were told during the site visits conducted in the initial phase of this project. The interviewees suggested that veterans who did not have someone to help them at home were often kept in the hospital or nursing home longer than those who did.

Table 3.2

Patient-Level Regression Results for the Policy Model (Excluding Basic Care Priority 7s)

		Base Case		VERA-3		VERA-10		VERA-47		VA DCGs	
	R-Squared	0.25		0.28		0.37		0.39		0.51	
Variable Category		Estimate	t-Statistic	Estimate	t-Statistic	Estimate	t-Statistic	Estimate	t-Statistic	Estimate	t-Statistic
Intercept		-644.70	-10.28 **	-762.80	-2.77 **	71682.98	267.78 **	7170.78	28.08 **	169022.11	173.89 **
Age											
	Missing			-1306.46	-16.66 **	-362.48	-4.94 **	-370.60	-5.07 **	689.83	10.68 **
	Less than 25			-2740.90	-27.97 **	-1311.17	-14.31 **	-1248.32	-13.77 **	254.91	3.16 **
	25-34			-2572.93	-39.79 **	-1530.02	-25.28 **	-1473.05	-24.60 **	265.99	5.00 **
	35-44			-1711.95	-28.88 **	-1037.06	-18.68 **	-1006.31	-18.29 **	533.08	10.94 **
	45-54			-904.65	-16.03 **	-450.90	-8.53 **	-370.01	-7.07 **	798.10	17.21 **
	55-64			-94.17	-1.65	181.38	3.40 **	265.83	5.06 **	961.41	20.52 **
	65-74			-687.39	-12.49 **	-272.80	-5.31 **	-233.37	-4.61 **	477.91	10.56 **
	75-84			-394.13	-7.12 **	-117.40	-2.27 *	-76.42	-1.50	265.10	5.83 **
	85 and over			Reference		Reference		Reference		Reference	
Sex											
	Missing			-192.86	-0.49	-148.03	-0.40	-124.44	-0.34	-46.84	-0.14
	Female			323.01	9.32 **	213.27	6.59 **	297.88	9.34 **	306.76	10.77 **
	Male			Reference		Reference		Reference		Reference	
Physicians per Capita											
	Less than 0.001			-354.67	-11.28 **	-250.19	-8.53 **	-218.06	-7.55 **	-56.43	-2.18 *
	0.001 to 0.002			-334.64	-12.37 **	-244.62	-9.69 **	-218.09	-8.78 **	-71.59	-3.22 **
	0.0021 to 0.003			-151.76	-5.91 **	-115.36	-4.82 **	-95.18	-4.04 **	-23.03	-1.09
	Greater than 0.003			Reference		Reference		Reference		Reference	
Hospital Beds per Capita											
	Less than 0.003			-267.39	-9.63 **	-199.23	-7.69 **	-197.16	-7.73 **	-150.77	-6.60 **
	0.003 to 0.006			-115.50	-4.62 **	-72.15	-3.09 **	-77.55	-3.38 **	-32.63	-1.59
	Greater than 0.006			Reference		Reference		Reference		Reference	
ARF Variables Missing	Missing			-244.45	-0.89	194.74	0.76	172.72	0.69	78.10	0.35
Rural/Urban Status											
	Missing			1731.67	5.54 **	1120.27	3.84 **	1052.76	3.66 **	810.05	3.15 **
	Urban			185.75	4.36 **	175.22	4.41 **	183.22	4.69 **	41.14	1.18
	Suburban			114.08	2.75 **	79.68	2.06 *	86.76	2.28 *	18.39	0.54
	Rural			-102.69	-2.25 *	-101.59	-2.39 **	-98.63	-2.36 *	-84.74	-2.26 *
	Very Rural			Reference		Reference		Reference		Reference	

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Table 3.2—continued

		Base Case		VERA-3		VERA-10		VERA-47		VA DCGs	
	R-Squared	0.25		0.28		0.37		0.39		0.51	
Variable Category		Estimate	t-Statistic	Estimate	t-Statistic	Estimate	t-Statistic	Estimate	t-Statistic	Estimate	t-Statistic
Distance to Closest Facility											
	Missing			-4555.30	-42.89 **	-3752.53	-37.83 **	-3688.91	-37.74 **	-2566.95	-29.38 **
	Less than 30 miles			-3099.72	-34.74 **	-2916.98	-35.02 **	-2828.58	-34.44 **	-2330.26	-31.77 **
	31 to 100 miles			-3111.76	-35.02 **	-2832.53	-34.15 **	-2759.68	-33.74 **	-2170.09	-29.71 **
	101 to 250 miles			-2524.72	-27.95 **	-2213.14	-26.24 **	-2161.92	-26.02 **	-1685.45	-22.7 **
	Greater than 250 miles			Reference		Reference		Reference		Reference	
Distance to Closest CBOC											
	Missing			1039.51	4.53 **	722.03	3.37 **	629.47	2.99 **	45.10	0.24
	Less than 30 miles			-248.45	-1.48	-205.92	-1.31	-247.85	-1.61	-200.75	-1.45
	31 to 100 miles			261.96	1.56	183.27	1.17	139.27	0.90	-48.47	-0.35
	Greater than 100 miles			Reference		Reference		Reference		Reference	
Medicare Reliance											
	Missing			3393.15	109.42 **	2542.15	87.78 **	2404.19	83.69 **	1451.37	56.95 **
	None			6238.67	190.74 **	4623.54	150.34 **	4533.86	149.28 **	2740.73	100.54 **
	1 to 24%			8692.82	245.63 **	6691.62	200.83 **	6563.72	199.42 **	3592.86	121.28 **
	25 to 49%			3621.76	85.78 **	2581.71	65.32 **	2568.04	65.94 **	908.95	26.04 **
	50 to 75%			1838.02	47.00 **	1011.46	27.63 **	1010.12	28.01 **	272.62	8.44 **
	75 to 100%			Reference		Reference		Reference		Reference	
Medicare Imputation Indicator				2677.46	73.14 **	2046.22	59.81 **	2007.07	59.60 **	1323.73	43.94 **
Medicaid Generosity LTC											
	Missing			-842.09	-2.46 *	-218.19	-0.68	-175.69	-0.56	-268.91	-0.96
	First Quartile (lowest)			824.76	11.21 **	726.90	10.58 **	669.17	9.90 **	443.23	7.33 **
	Second Quartile			578.74	9.03 **	492.73	8.24 **	456.86	7.77 **	308.77	5.86 **
	Third Quartile			654.10	11.88 **	591.81	11.52 **	552.85	10.94 **	332.11	7.34 **
	Fourth Quartile (highest)			Reference		Reference		Reference		Reference	

* Indicates statistical significance at 95% confidence level.

** Indicates statistical significance at 99% confidence level.

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NOTE: The data on physicians per capita and hospital beds per capita from the ARF data were missing for the same group of individuals. As a result, only one missing category can be estimated between the two variables. That estimate is reported in the row labeled ARF Variables Missing.

Facility and case mix coefficient estimates were excluded from the table for expositional reasons.

teristics, locations, and input prices. The results of this effort for the policy model are shown in Table 3.3.

The performance of the five facility-level equations was approximately equal in explaining facility cost shifts, with the regressions' R-squared statistics ranging from a low of 0.35 in the base case equation to a high of 0.44 when VERA-3 is used to measure health status. Few variables in the policy model equations are statistically significant at conventional levels ($p < 0.05$). This finding may be due in part to the relatively small number of facilities used to estimate the equations (i.e., 143). Additionally, in considering the facility-level regression results, it is important to bear in mind that estimated parameters reflect the influence of the corresponding variables after controlling for the patient characteristics that were included in the patient-level regressions.

Two facility-level characteristics had a significant positive impact on facility cost shifts across all case-mix specifications: the VISN labor index and research costs per patient. In addition, contract labor appears to have a cost-decreasing effect. That is, as the share of labor costs paid to contract workers increases, the facility cost shift decreases. Although the effects are not statistically significant at conventional levels across all specifications, several other variables in the facility equations are of interest. Average food costs per bed day are found to have a positive impact on facility costs. In addition, square feet of building space, both per patient and per acre of land, are positively associated with facility costs.

The results from the VA DCG case-mix specification tell a somewhat different story. In addition to the effects described above, several other facility characteristics were identified as having a significant impact on facility-specific costs. Perhaps the most interesting finding is that the ratio of residents to physicians had a cost-decreasing effect. In other words, holding all other factors constant, having more residents relative to the number of attending physicians was associated with lower facility-specific cost shifts, which indicates that residents may serve to increase physician productivity.

Comparison with the Fully Specified Facility-Level Equation

The set of variables that are significant in the facility equation varies somewhat between the fully specified and the policy models.[3] In the fully specified model, four variables were significant across all case-mix specifications: the labor cost index, the number of non-patient care FTEs per unique patient, research costs, and square feet per patient. Not surprisingly, facilities in areas with a higher labor cost were found to have higher-than-average cost shifts. Also, increasing the number of non-patient care FTEs relative to patients is found to increase costs. After controlling for all of the individual and other facility characteristics, increases in research costs are associated

[3]This observation may be due to a number of factors, including omitted variables bias.

Table 3.3

Facility-Level Regression Results for the Policy Model (Priority 7s Excluded)

	Base Case		VERA-3		VERA-10		VERA-47		VA DCGs	
R-Squared	0.35		0.44		0.42		0.43		0.38	
Variable	**Estimate**	**t-Statistic**	**Estimate**	**t-Statistic**	**Estimate**	**t-Statistic**	**Estimate**	**t-Statistic**	**Estimate**	**t-Statistic**
Intercept	-2597.02	-1.16	-5240.49	-2.15 *	-4540.64	-2.18 *	-4595.39	-2.24 *	-4779.62	-2.22 *
Rural/Urban Status										
Urban			-176.02	-0.24	-312.19	-0.49	-281.98	-0.45	-495.75	-0.76
Suburban			-630.10	-0.83	-657.66	-1.01	-622.83	-0.97	-967.99	-1.44
Rural			-358.89	-0.42	-409.44	-0.56	-401.16	-0.55	-741.69	-0.98
Very Rural			Reference		Reference		Reference		Reference	
Residents per Full-time MD	500.63	2.43 *	185.84	0.74	143.28	0.67	139.24	0.66	-636.97	-2.88 **
VA Labor Index	2729.02	1.22	5909.23	2.29 *	5757.77	2.61 *	5665.04	2.61 *	5828.21	2.56 *
Average Food Cost per Bed Day			38.10	1.50	29.41	1.35	29.06	1.36	15.22	0.68
Energy Price (dollars per million BTUs)			36.74	0.52	15.17	0.25	14.33	0.24	73.65	1.19
Contract Labor Costs			-9090.51	-2.90 **	-6710.01	-2.51 *	-6332.42	-2.40 *	-6742.74	-2.44 *
Square Feet of Building Space per Acre of Land			3.74	1.06	4.84	1.61	4.72	1.59	6.84	2.20 *
Square Feet of Building Space per Unique Patient			11.75	2.70 **	6.16	1.66	5.67	1.55	6.52	1.70
Research Costs per 1000 Unique Patients	0.006	5.17 **	0.006	4.79 **	0.005	4.68 **	0.005	4.87 **	0.006	5.10 **

* Indicates statistical significance at 95% confidence level.

** Indicates statistical significance at 99% confidence level.

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with increases in average facility costs. Finally, increases in square feet per patient lead to increased facility costs. In other words, facilities that are large relative to their patient population have higher costs.

When the VA DCG specification was used, greater correspondence was found between the policy and fully specified facility-level results. Four of the five variables that were found to be significant in the policy equation were also significant in the fully specified version. In addition, the results show that the amount of leased building space is positively related to facility costs. (The fully specified facility-level equation results are presented in Appendix Table D.3).

As was true for the policy model, there are other facility variables in the fully specified version that are not statistically significant at conventional levels across all specifications, but that warrant discussion. Again, we find that the density measure, square feet of building space per acre of land, is positively associated with facility costs. In addition, the results indicate that average costs are higher at facilities that rely more heavily on leased building space. The number of CBOCs associated with a facility per patient treated also increases costs. Finally, we find that after controlling for all other characteristics, increases in the number of long-term care beds per patient are associated with reductions in average facility costs.

SIMULATION RESULTS

As described in Chapter Two, the results from the regression models were used to simulate VISN allocations under various scenarios. In this section, we focus on the simulation results based on the policy model. We also discuss the key differences in simulated allocations between the policy and fully specified models.

To interpret the simulation results, we made three sets of comparisons. First, we compared the actual FY 2002 VERA allocations to the base case simulated VERA allocations. These are the allocations our regression-based methodology would yield when taking into account only those variables—the three VERA patient categories, the labor index, research costs, and teaching costs—that are currently incorporated into VERA. This comparison allowed us to isolate the effect of the difference between our regression-based methodology and the VERA methodology currently used by the VA. Second, we compared our VERA-3 policy model simulated allocations to the base case allocations. This comparison allowed us to determine the effects of the additional variables included in the policy model, holding the methodology constant. Finally, we compared our VERA-3 policy model to the other case-mix specifications to isolate the effect of alternative health status measures. All of the simulated allocations have been normalized to distribute the $18.3 billion appropriation for FY 2002.[4]

[4]The VA medical care appropriation in FY 2002 was $21.3 billion, of which $18.3 billion was distributed to the VISNS, as of December 7, 2001, using the VERA model.

Actual Versus Base Case Allocations

In the comparison between the actual allocations and the base case simulated allocations presented in Table 3.4, we see that under the base case, 13 VISNs would receive allocations that are larger than the actual allocations. However, the percentage differences between the two allocations are relatively small. The difference between the base case and actual allocations (positive or negative) is greater than 5 percent for five VISNs and greater than 10 percent for only one. The median percentage of

Table 3.4

Comparison of FY 2002 VERA Allocation with Simulated Base Case Allocation (in $1,000)

VISN	FY02 VERA Allocation	Simulated Base Case Allocation	Diff from FY02
01 Boston	909,715	949,752	4.4%
02 Albany	497,198	509,791	2.5%
03 Bronx	1,037,301	894,427	-13.8%
04 Pittsburgh	936,020	937,539	0.2%
05 Baltimore	564,929	536,548	-5.0%
06 Durham	861,286	839,227	-2.6%
07 Atlanta	1,050,304	1,061,837	1.1%
08 Bay Pines	1,437,387	1,441,697	0.3%
09 Nashville	831,591	879,664	5.8%
10 Cincinnati	682,951	652,254	-4.5%
11 Ann Arbor	750,330	748,752	-0.2%
12 Chicago	883,268	875,625	-0.9%
13 Minneapolis	508,738	486,750	-4.3%
14 Lincoln	348,050	326,590	-6.2%
15 Kansas City	703,102	721,308	2.6%
16 Jackson	1,466,801	1,484,782	1.2%
17 Dallas	832,097	842,255	1.2%
18 Phoenix	715,290	717,759	0.3%
19 Denver	473,985	468,747	-1.1%
20 Portland	824,844	825,236	0.0%
21 San Francisco	931,506	966,438	3.8%
22 Long Beach	1,062,308	1,142,025	7.5%
23 Lincoln & Minneapolis*	856,788	813,339	-5.1%
Total	18,309,001	18,309,001	

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*VISNs 13 and 14 recently merged to form VISN 23. The table shows results for VISNs 13 and 14 separately and together as VISN 23. The amount for VISN 23 is excluded from the total as it is already incorporated through individual entries for VISNs 13 and 14.

VISN allocations that would be redistributed (i.e., gained or lost) is 2.5 percent. In aggregate, the total amount of money that would be redistributed across all VISNs between the two allocations is $282 million, or 1.5 percent of the total appropriation.

In general, these results illustrate the effect of using our regression-based methodology as opposed to the current VERA system to make VISN-level allocations. Some of the difference in the results may also be due to the fact that the two approaches measure particular factors (e.g., workload and teaching) in somewhat different ways. Moreover, it is important to note that our regression methodology is based on one year of data (FY 2000). The current VERA methodology uses a three-year retrospective to determine Basic Care workload, and a five-year retrospective to forecast one year of Complex Care workload for its allocation formula. This difference in the calculation of workload may also account for some of the differences observed between the base case and the actual FY 2002 allocations. It is also possible that some of the differences in allocations between the two methods can be explained by the fact that for a small number of VISNs, the actual allocations include the supplemental allocations.[5] As a result, the actual allocations are not based solely on the VERA methodology and, thus, are affected by factors that are not included in our base case regression equations.

Adding Individual and Facility Variables

The second set of comparisons, shown in Table 3.5, is intended to illustrate the effects of incorporating additional individual and facility variables into the model, holding methodology constant. In comparing the base case simulations to the VERA-3 policy model simulations, we can isolate the impact of the variables other than case mix (e.g., age, Medicare reliance, Medicaid generosity, and energy prices). The table shows the simulated allocations and the percentage difference between the base case and the VERA-3 policy model. Here, we see that 13 VISNs would receive larger allocations under this version of the policy model than under the base case. The largest increases occur in VISNs 6 and 11, for which the VERA-3 policy model-simulated allocation is 6.5 percent greater than the base case. On the other end of the spectrum, 9 VISNs would receive lower allocations when the additional variables are included in the model. The largest decrease, 18.0 percent, is seen for VISN 10. Overall, the absolute median difference between the base case and the VERA-3 simulated allocations is 3.5 percent, with the difference (positive or negative) being greater than 5 percent for eight VISNs and greater than 10 percent for only two. The total amount of money that is redistributed by the VERA-3 model relative to the base case is $434 million, or 2.4 percent of the total appropriation.

[5]Five VISNs received supplemental allocations in FY 2002: VISNs 1, 3, 12, 13, and 14. The supplements ranged in size from a low of $20.8 million for VISN 12 to a high of $128.5 million for VISN 3.

Table 3.5

Comparison of Base Case and VERA-3 Policy Model Simulated Allocations (in $1,000)

VISN	Base Case VERA-3	VERA -3	
		Simulated Allocation	Diff from Base
01 Boston	949,752	934,580	-1.6%
02 Albany	509,791	523,507	2.7%
03 Bronx	894,427	921,046	3.0%
04 Pittsburgh	937,539	802,611	-14.4%
05 Baltimore	536,548	515,071	-4.0%
06 Durham	839,227	893,982	6.5%
07 Atlanta	1,061,837	1,068,961	0.7%
08 Bay Pines	1,441,697	1,452,648	0.8%
09 Nashville	879,664	921,294	4.7%
10 Cincinnati	652,254	534,547	-18.0%
11 Ann Arbor	748,752	797,467	6.5%
12 Chicago	875,625	901,712	3.0%
13 Minneapolis	486,750	499,848	2.7%
14 Lincoln	326,590	332,678	1.9%
15 Kansas City	721,308	712,742	-1.2%
16 Jackson	1,484,782	1,574,262	6.0%
17 Dallas	842,255	841,575	-0.1%
18 Phoenix	17,759	751,288	4.7%
19 Denver	468,747	437,073	-6.8%
20 Portland	825,236	815,112	-1.2%
21 San Francisco	966,438	1,028,315	6.4%
22 Long Beach	1,142,025	1,048,681	-8.2%
23 Lincoln & Minneapolis*	813,339	832,526	2.4%
Total amount allocated	18,309,001	18,309,001	

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*VISNs 13 and 14 recently merged to form VISN 23. The table shows results for VISNs 13 and 14 separately and together as VISN 23. The amount for VISN 23 is excluded from the total as it is already incorporated through individual entries for VISNs 13 and 14.

Comparing Alternative Case-Mix Measures

The third set of comparisons, shown in Table 3.6, was designed to illustrate the effect of alternative case-mix specifications on VISN-level allocations. Here, we compared the simulations from the VERA-3 policy model to those from the VERA-10, VERA-47, and VA DCG models. The results show that the simulations from the VERA-10 and VERA-47 are relatively similar to those from the VERA-3 model. Although approxi-

Table 3.6
Comparison of Simulated Allocations by Case-Mix Measure Using the Policy Model (in $1,000)

VISN	VERA-3 Policy Model	VERA-10		VERA-47		VA DCGs	
		Simulated Allocation	Diff from VERA-3	Simulated Allocation	Diff from VERA-3	Simulated Allocation	Diff from VERA-3
01 Boston	934,580	936,805	0.2%	940,086	0.6%	933,542	-0.1%
02 Albany	523,507	514,263	-1.8%	515,606	-1.5%	510,899	-2.4%
03 Bronx	921,046	923,713	0.3%	924,130	0.3%	929,513	0.9%
04 Pittsburgh	802,611	852,401	6.2%	857,828	6.9%	817,956	1.9%
05 Baltimore	515,071	508,861	-1.2%	510,980	-0.8%	514,493	-0.1%
06 Durham	893,982	893,365	-0.1%	897,570	0.4%	891,158	-0.3%
07 Atlanta	1,068,961	1,046,486	-2.1%	1,038,089	-2.9%	1,001,137	-6.3%
08 Bay Pines	1,452,648	1,479,467	1.8%	1,462,093	0.7%	1,518,067	4.5%
09 Nashville	921,294	909,424	-1.3%	908,780	-1.4%	895,348	-2.8%
10 Cincinnati	534,547	559,036	4.6%	568,307	6.3%	584,123	9.3%
11 Ann Arbor	797,467	807,458	1.3%	808,811	1.4%	777,155	-2.5%
12 Chicago	901,712	910,360	1.0%	911,670	1.1%	906,665	0.5%
13 Minneapolis	499,848	510,891	2.2%	513,458	2.7%	568,469	13.7%
14 Lincoln	332,678	326,397	-1.9%	330,112	-0.8%	342,344	2.9%
15 Kansas City	712,742	708,300	-0.6%	711,605	-0.2%	739,214	3.7%
16 Jackson	1,574,262	1,544,495	-1.9%	1,539,069	-2.2%	1,476,776	-6.2%
17 Dallas	841,575	833,180	-1.0%	827,937	-1.6%	805,983	-4.2%
18 Phoenix	751,288	733,353	-2.4%	736,174	-2.0%	738,035	-1.8%
19 Denver	437,073	441,868	1.1%	443,634	1.5%	483,815	10.7%
20 Portland	815,112	807,453	-0.9%	807,636	-0.9%	863,372	5.9%
21 San Francisco	1,028,315	1,008,070	-2.0%	1,006,221	-2.1%	999,954	-2.8%
22 Long Beach	1,048,681	1,053,354	0.4%	1,049,206	0.1%	1,010,984	-3.6%
23 Lincoln & Minneapolis*	832,526	837,289	0.6%	843,570	1.3%	910,814	9.4%
Total amount allocated	18,309,001	18,309,001		18,309,001		18,309,001	

* VISNs 13 and 14 recently merged to form VISN 23. The table shows results for VISNs 13 and 14 separately and together as VISN 23. The amount for VISN 23 is excluded from the total as it is already incorporated through individual entries for VISNs 13 and 14.

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mately half the VISNs would receive a larger allocation under the more refined VERA-based case-mix measures, the size of the difference is rather small. For the VERA-10 and the VERA-47, one and two VISNs, respectively, would gain or lose more than 5 percent relative to the VERA-3 policy model. Moreover, the median percentage gained or lost at the VISN level relative to VERA-3 is 1.3 under VERA-10 and 1.4 under VERA-47. In addition, it is interesting to note that the direction of the redistribution from VERA-3 to the other VERA-based case-mix measures is the same for all but one VISN. In other words, the pattern of redistribution under VERA-10 and VERA-47 relative to VERA-3 is essentially the same. At the national level, the total amount of money that would be redistributed when moving from the VERA-3 case mix to a more refined VERA-based case-mix measure ranges from $145.1 million under VERA-10 to $152.6 under VERA-47, or approximately 0.8 percent of the total appropriation.

The difference between the VERA-3 and VA DCG policy models is more striking. In moving from VERA-3 to VA DCGs, the magnitude of the difference between simulated allocations ranges from a reduction of 6.3 percent for VISN 7 to an increase of 13.7 percent for VISN 13. Overall, six VISNs would experience changes in allocations (positive or negative) greater than 5 percent with two of those seeing changes over 10 percent. Moreover, the median percentage difference in allocations at the VISN-level is 2.9 percent. Finally, in aggregate, $343.5 million (1.9 percent) is redistributed by moving from VERA-3 to VA DCGs.

Taken together, the results from the comparison between the VERA-3 and the other case-mix measures highlight two important points about the alternative case-mix measures that are currently under consideration by the VA. First, the movement from VERA-3 to VA DCGs redistributes substantially more money than would the movement to either VERA-10 or VERA-47. At the VISN-level, the median percentage change was twice as great under VA DCGs as under the VERA-based case-mix measures. Similarly, at the national level, the move to VA DCGs would redistribute 1.9 percent of the total appropriation, compared to approximately 1 percent under VERA-10 and VERA-47. Second, the pattern of redistribution varies between VA DCGs and the more refined VERA-based case-mix measures. In other words, the set of VISNs that would gain (or lose) from a move to the VERA-based case-mix measures is not the same as the set that would gain (or lose) from a move to VA DCGs. For example, in comparing VERA-10 and VA DCGs, the direction of the change would be different for six VISNs. Three VISNs whose allocations would increase under a move to VERA-10 or VERA-47 would receive lower allocations under VA DCGs. Along the same lines, three VISNs that would receive smaller allocations under VERA-10 or VERA-47 would receive larger allocations under VA DCGs. However, we note that the absolute value of higher or lower allocations is relatively small for these six VISNs; for VISNs that would receive relatively large reallocations, the sign of the reallocation is consistent across the three alternative case-mix measures.

Comparison of Simulation Results with Fiscal Year 2002 Actual Allocations

To this point the allocation comparisons that we have discussed were designed to isolate the effects of methodology, additional adjustments, and alternative case-mix measures. However, it is important to consider the full impact of the movement from the current system to the regression-based methodology used in our analysis. To do this, we compared the policy model simulated allocations for each case-mix specification to the actual FY 2002 allocations. The results of this comparison are presented in Table 3.7. It is interesting to note that when we consider the effects of all changes at once, there is greater correspondence in terms of the set of VISNs that gain (or conversely, lose) relative to actual allocations between the VA DCG and the VA patient classification-based case-mix specifications. For example, in comparing allocations under VERA-10 and VA DCGs, the direction of the redistribution changes for only three VISNs. When the effect of case-mix was considered separately, we found that the direction of the redistribution was different for six VISNs. This difference could be caused by a number of factors such as the inclusion of supplementals in the FY 2002 allocations or the effect of interactions between the case-mix and other patient or facility variables.

Comparison with Simulation Results from the Fully Specified Model

We found that the simulated allocations based on the fully specified model are somewhat different from those based on the policy model (see Appendix Table D.4). This finding is not surprising since the fully specified model controls for a wider array of patient- and facility-level factors. For all case-mix specifications in the policy model, we found that approximately half the VISNs would gain money under the simulated allocation relative to the actual allocations received in FY 2002. Turning to the fully specified model does not substantially change the set of VISNs that would gain under the simulation, with the direction of the redistribution changing for only three to five VISNs, depending on the case-mix specification. However, what does change under the various models is the magnitude of the simulated allocations. Between 9 and 12 VISNs, depending on the case-mix specification, receive larger simulated allocations under the fully specified model than under the policy model. These VISNs appear to be concentrated in the Midwest and Southeast regions of the country.

The results also show that under the case-mix specifications based on the VA patient classes, more money is redistributed relative to the actual allocations under the simulations based on the fully specified than under those based on the policy model. In the fully specified model, the percentage of the total appropriation that would be redistributed ranges from 2.9 percent with VERA-10 and VERA-47 to 3.3 percent with VERA-3. In the policy model, the redistribution is approximately 2.5 percent, 2.5 percent, and 2.9 percent, for VERA-10, VERA-47, and VERA-3, respectively. In contrast, for VA DCGs, fewer dollars are redistributed in the fully specified model (2.2 percent in the fully specified model versus 2.8 percent in the policy model).

Table 3.7

Comparisons of FY 2002 VERA Allocations with Simulated Allocations by Case-Mix Measure (in $1,000)

VISN	VERA FY 02 Actual Allocation	Base Case Model		VERA-3 Policy Model		VERA-10		VERA-47		VA DCGs	
		Simulated Allocation	Diff from FY 02	Simulated Allocation	Diff from FY 02	Simulated Allocation	Diff from FY 02	Simulated Allocation	Diff from FY 02	Simulated Allocation	Diff from FY 02
01 Boston	909,715	949,752	4.4%	934,580	2.7%	936,805	3.0%	940,086	3.3%	933,542	2.6%
02 Albany	497,198	509,791	2.5%	523,507	5.3%	514,263	3.4%	515,606	3.7%	510,899	2.8%
03 Bronx	1,037,301	894,427	-13.8%	921,046	-11.2%	923,713	-11.0%	924,130	-10.9%	929,513	-10.4%
04 Pittsburgh	936,020	937,539	0.2%	802,611	-14.3%	852,401	-8.9%	857,828	-8.4%	817,956	-12.6%
05 Baltimore	564,929	536,548	-5.0%	515,071	-8.8%	508,861	-9.9%	510,980	-9.5%	514,493	-8.9%
06 Durham	861,286	839,227	-2.6%	893,982	3.8%	893,365	3.7%	897,570	4.2%	891,158	3.5%
07 Atlanta	1,050,304	1,061,837	1.1%	1,068,961	1.8%	1,046,486	-0.4%	1,038,089	-1.2%	1,001,137	-4.7%
08 Bay Pines	1,437,387	1,441,697	0.3%	1,452,648	1.1%	1,479,467	2.9%	1,462,093	1.7%	1,518,067	5.6%
09 Nashville	831,591	879,664	5.8%	921,294	10.8%	909,424	9.4%	908,780	9.3%	895,348	7.7%
10 Cincinnati	682,951	652,254	-4.5%	534,547	-21.7%	559,036	-18.1%	568,307	-16.8%	584,123	-14.5%
11 Ann Arbor	750,330	748,752	-0.2%	797,467	6.3%	807,458	7.6%	808,811	7.8%	777,155	3.6%
12 Chicago	883,268	875,625	-0.9%	901,712	2.1%	910,360	3.1%	911,670	3.2%	906,665	2.6%
13 Minneapolis	508,738	486,750	-4.3%	499,848	-1.7%	510,891	0.4%	513,458	0.9%	568,469	11.7%
14 Lincoln	348,050	326,590	-6.2%	332,678	-4.4%	326,397	-6.2%	330,112	-5.2%	342,344	-1.6%
15 Kansas City	703,102	721,308	2.6%	712,742	1.4%	708,300	0.7%	711,605	1.2%	739,214	5.1%
16 Jackson	1,466,801	1,484,782	1.2%	1,574,262	7.3%	1,544,495	5.3%	1,539,069	4.9%	1,476,776	0.7%
17 Dallas	832,097	842,255	1.2%	841,575	1.1%	833,180	0.1%	827,937	-0.5%	805,983	-3.1%
18 Phoenix	715,290	717,759	0.3%	751,288	5.0%	733,353	2.5%	736,174	2.9%	738,035	3.2%
19 Denver	473,985	468,747	-1.1%	437,073	-7.8%	441,868	-6.8%	443,634	-6.4%	483,815	2.1%
20 Portland	824,844	825,236	0.0%	815,112	-1.2%	807,453	-2.1%	807,636	-2.1%	863,372	4.7%
21 San Francisco	931,506	966,438	3.8%	1,028,315	10.4%	1,008,070	8.2%	1,006,221	8.0%	999,954	7.3%
22 Long Beach	1,062,308	1,142,025	7.5%	1,048,681	-1.3%	1,053,354	-0.8%	1,049,206	-1.2%	1,010,984	-4.8%
23 Lincoln & Minneapolis*	856,788	813,339	-5.1%	832,526	-2.8%	837,289	-2.3%	843,570	-1.5%	910,814	6.3%
Total amount allocated	18,309,001	18,309,001		18,309,001		18,309,001		18,309,001		18,309,001	

* VISNs 13 and 14 recently merged to form VISN 23. The table shows results for VISNs 13 and 14 separately and together as VISN 23. The amount for VISN 23 is excluded from the total as it is already incorporated through individual entries for VISNs 13 and 14.

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SENSITIVITY ANALYSES

In addition to comparing the four case-mix specifications described above, we conducted a number of analyses to determine how stable, or sensitive, our findings were to various modifications in our modeling approach.

Alternative Definition of the Analysis Sample

The exclusion of Basic Care Priority 7 veterans from the current VERA allocation methodology is the subject of ongoing debate within the VA. Consequently, we felt it was important to test the sensitivity of the model results to the inclusion of Basic Care Priority 7 veterans in the analysis sample. Although the characteristics of the Basic Care Priority 7 veterans are somewhat different from those of veterans in the other priority groups, the inclusion of Basic Care Priority 7 veterans does not qualitatively change the estimated regression coefficients in either the patient- or facility-level equations. Moreover, the R-squared statistics from the models that include the Basic Care Priority 7s are virtually the same as those from the primary analysis. In other words, the models with and without Basic Care Priority 7s explain the same amount of the variation in annual patient-level costs (see Appendix Tables D.5 and D.6).

Even though the regression results are similar, we found that the simulated allocations vary across the two specifications, largely because the distribution of Basic Care Priority 7 veterans differs across VISNs. If Basic Care Priority 7 veterans make up a large share of a VISN's patient population relative to other VISNs, then that VISN will receive less under an allocation system that excludes Basic Care Priority 7 veterans. Conversely, VISNs with a smaller proportion of Priority 7s will tend to gain under an allocation methodology that excludes Priority 7s. (Simulation results for the fully specified model are in Appendix Table D.7).

Interestingly, the inclusion of Basic Care Priority 7 veterans had little impact on which VISNs gain in the simulated allocations relative to the actual allocations they received. In the VERA-10, VERA-47, and VA DCG case-mix specifications, the set of VISNs whose payments increase under the simulated allocation is virtually the same in the models including and excluding Basic Care Priority 7 veterans, with the direction of redistribution changing for only one VISN in each case. For the VERA-3 specification, the direction of the redistribution changes for three VISNs.

Although including Basic Care Priority 7 veterans in the sample would have little impact on the direction of the redistributions, it would have a substantial effect on their magnitude. Across all of the case-mix specifications, approximately half of the VISNs would receive a larger allocation if the Basic Care Priority 7 veterans were included in the model. For example, using the VERA-10 policy model, 11 VISNs would receive, on average, an additional $11.9 million. In addition, the set of VISNs that would gain from the inclusion is relatively constant across the case-mix specifications and is concentrated in the Northeast, Southwest, and Midwest regions of the country. However, it is important to keep in mind that the redistribution of the appropriation

through the simulation is a zero-sum game. An increase in the payment to a particular VISN is offset by a reduction in payments to one or more other VISNs. As such, approximately half of the VISNs receive a smaller allocation when the Basic Care Priority 7 veterans are included in the model. (The results from the fully specified model, including Priority 7 patients, are shown in Appendix Tables D.8–D.10.)

Alternative Years

We then estimated the same set of models described above using data from FY 1999 rather than FY 2000. The explanatory power of the regressions (as measured by the R-squared statistic) and the estimated coefficients were very stable from year to year. This finding lends support to the validity of the regression equation because it shows that the results are not idiosyncratic to a particular year.

Alternative Definitions of Patient-Level Costs

The final set of sensitivity analyses employed three alternative measures of patient-level costs: ARC, DSS, and HERC. As discussed in Chapter Two, to simplify the comparison across the three alternative costing methodologies, we estimated regression models on the sample of veterans who were treated at only one facility during the year. We further simplified the comparison by estimating these models for only two of the case-mix specifications: VERA-3 and VA DCGs. Although the three costing methodologies are quite different, the regression results from each are very similar (see Appendix Tables D.11 and D.12). For the patient-level equations, we found very few differences in the estimated effects of the explanatory variables on resource use. The differences that we did find were generally for variables that measure locational characteristics (e.g., rural or urban status and hospital beds per capita) and were relatively small. Similarly, in the facility-level regression equations, the results were quite stable across the different costing methodologies. Moreover, the similarity in the results occurs in both the VERA-3 and the VA DCG case-mix specifications. Finally, the simulated VISN-level allocations were substantively similar under the various costing methodologies.

Chapter Four

CONCLUSIONS AND POLICY IMPLICATIONS

Our analyses of VERA focused on assessing the impact of particular variables on patient care costs. We also estimated how VISN allocations change after controlling for various patient and facility characteristics. Throughout our analysis, we focused on the concerns expressed by Congress in the legislation authorizing the study.

Our major findings can be summarized as follows:

- The current VERA system for allocating resources to VISNs does not account for a number of measurable factors that affect patient care costs, including patient and facility characteristics that vary systematically across VISNs and that are largely beyond VISN directors' control. Alternative methods for allocating resources to VISNs, based on the principles that guide VERA but that better account for these factors, may produce a more equitable allocation system.
- Case-mix measures play a key role in explaining patient-level cost differences. Overall, more-detailed case-mix measures accounted for more of the variation in patient care costs than less-detailed measures. All three alternatives examined in this report had significantly more explanatory power than the method currently used in VERA.
- Age and sex independently affect patient care costs, controlling for alternative case-mix measures and other factors.
- The degree to which VA patients rely on Medicare providers for the care they receive has a significant impact on VA costs. As we might expect, patients who are more reliant on Medicare providers incur lower VA costs vis-à-vis those patients who receive little or no care from Medicare providers.
- Veterans who live in urban and suburban areas use more resources than those who reside in rural areas. At the same time, costs are higher for those veterans who must travel longer distances for care.
- Most facility infrastructure characteristics—including age, historical significance, total building count, and average physical condition—do not appear to have a significant independent effect on patient care costs. However, the number of square feet of building space both per patient (a measure of building capacity and the extent to which it is being used efficiently) and per acre of land (a measure of the density of the infrastructure) increased average facility costs.

- The choice of case-mix measure and the other factors included in the policy model influence whether teaching is an important factor in explaining patient care costs. Teaching intensity is a significant factor only with the VA DCGs, where it has a negative effect on facility costs (facility costs decrease as the ratio of residents to physicians increases).
- Research intensity (measured by the research costs per 1,000 unique patients) is positively associated with facility costs.
- In comparing our simulation results to actual FY 2002 allocations, we found that for our base case—in which we applied our regression methodology and controlled for the same set of factors that the VA currently controls for—$282 million, or 1.5 percent of the total appropriation, would be redistributed across the VISNs.
- To determine the effect of including additional variables (e.g., age, gender, and Medicare reliance), we compared the simulations from the base case to those from the VERA-3 policy model. The total amount of money that is redistributed by the VERA-3 policy model, relative to the base case, is $433 million, or 2.4 percent of the total appropriation.
- To illustrate the effect of alternative case-mix measures, we compared simulations from the VERA-3 policy model with those from the other case-mix specifications. The choice of case-mix measure has a substantial impact on VISN allocations. Each of the three alternative case-mix measures examined here (VERA-10, VERA-47, and VA DCGs) would result in substantial movement of budget allocations across VISNs. The magnitude of the budget reallocation (relative to VERA-3) is sensitive to the choice of alternative case-mix measure. For some VISNs, the direction of the budget reallocation also varies by case-mix measure (i.e., some VISNs would gain if the VA shifted to VERA-10, but those same VISNs would lose if the VA shifted to VA DCGs). However, this shift in direction occurs only in cases where the gain or loss is relatively small.
- The results from the comparisons between the VERA-3 policy model and policy models with the other case-mix measures illustrate that the movement from VERA-3 to VA DCGs redistributes substantially more money than would the movement to either VERA-10 or VERA-47. At the national level, the move to VA DCGs would redistribute 1.9 percent of the total appropriation compared to approximately 1 percent under VERA-10 and VERA-47.
- Our results were relatively insensitive to several methodological factors: the method used to allocate costs to patients (for the alternative cost methods we could examine), whether or not the Basic Care Priority 7 patients were included in the patient and facility regression equations, and the year of data used to estimate the models.
- When we included Basic Care Priority 7 veterans in the simulations, approximately half of the VISNs received larger simulated allocations and half received smaller allocations, compared to the simulated allocations based on policy models that excluded these patients (but included Complex Care Priority 7 veterans).

In light of these findings, we believe that the VA should consider modifying VERA to take greater account of patient and facility characteristics than it does now. Movement in this direction would retain most of the strengths of VERA while increasing the alignment between VISN allocations and patients' health care needs. Specifically, we believe that VERA should expand the number of adjustments that it currently makes, to take into account the patient- and facility-level variables included in the policy model.

In principle, this expansion could be accomplished by sequentially adjusting VERA's set of national prices—which, as indicated previously, are currently based on only three case types—for each variable included in the policy model. However, in practice, this modification would prove to be quite cumbersome. As a result, we recommend that the VA consider adopting an allocation system that relies on a regression/simulation framework similar to the one used in our analysis.

On the positive side, our modeling approach relies on data that are readily available and provides a method for generating VISN allocations after adjusting for both patient and facility characteristics. Our approach is also very flexible in that variables can easily be added or deleted to reflect changing policy objectives. We recognize, however, that our approach is somewhat complicated and may be difficult to implement. It may also represent a shift in underlying philosophy in that it attempts to link allocations more closely with particular costs (e.g., those related to treating more-complex cases and other costs that are beyond the control of VISN directors) vis-à-vis the current VERA system. Thus, before the VA implements an allocation system along the lines of the one we have suggested here, we believe it is important to conduct additional analyses to better understand how particular variables influence VISN allocations and to educate all relevant stakeholders on the pros and cons of adopting the regression-based allocation framework and of making adjustments above and beyond those currently included in the VERA system.

CASE-MIX ADJUSTMENT

When judging the merits of alternative case-mix adjustment systems, policymakers must take into account a number of factors, including explanatory power, incentive effects, transparency, and administrative complexity. In light of these findings, we believe that it is desirable for the VA to take greater account of case-mix differences across facilities and VISNs than the three case-mix categories (i.e., Basic Vested, Basic Non-Vested, and Complex Care) on which VERA is currently based. Doing so would lead to a more equitable and efficient distribution of VA resources. Specifically, among the four alternatives we considered (VERA-3, VERA-10, VERA-47, and VA DCGs), we recommend that the VA consider adopting either the VERA-10 or the VA DCGs case-mix measures. While VERA-47 represents an improvement over VERA-3 in the amount of patient cost variation explained, VERA-47 provides only a small improvement over VERA-10 while introducing considerably more complexity into the allocation system.

The choice between VERA-10 and VA DCGs involves some trade-offs. VA DCGs have greater explanatory power, compared with the VERA-10 case-mix measure; and they

are less likely to create an incentive to increase lengths of stay or to steer patients toward inpatient rather than outpatient care, because they are not based on patient utilization. However, VA DCGs are also less transparent than are the VERA-10 groups and would probably be more difficult to administer, at least in the short run. In addition, VA research has found that DCGs may be relatively less effective in accounting for long-term care and inpatient mental health costs. In the event that the VA decides to implement a DCG-based system, we recommend that the VA continue to explore refinements to that system, particularly with respect to severely mentally ill patients and those in long-term care.

Finally, as noted above, some VISNs would experience a positive reallocation under VERA-10, relative to VERA-3, and a negative reallocation under VA DCGs, or vice versa. While these patterns apply primarily to VISNs for which the absolute reallocation is relatively small, additional research to identify the reasons for these patterns may help inform the choice between VERA-10 and VA DCGs.

ACADEMIC AFFILIATIONS

The current method of funding education support and research support costs through separate allocations should be reconsidered if the allocation process is modified to include more-refined case-mix measures and/or a broader set of individual and facility characteristics. To some extent, the current education support allocations adjust for unmeasured case-mix differences and omitted variables. By refining the case-mix measure and adding other individual and facility factors, the size and the magnitude of the teaching measure changes. In the base case, the variable we used for teaching intensity (ratio of residents to physicians) is significant and positive. In the VERA-3, VERA-10, and VERA-47 policy and fully specified models, the variable is no longer significant. When VA DCGs are used as the case-mix measure, the teaching variable becomes significant and negative, that is, facility costs decrease as the ratio of residents to physicians increases. This finding suggests that the patient care services performed by the residents more than offset the costs of teaching-physician educational activities, once case mix and other factors are taken into account. If VA DCGs were implemented, continuing the education support allocations would provide excessive funding to teaching-intensive VISNs relative to other VISNs. We note that the effect of research activity on costs is less sensitive to the case-mix measure and other variables that are included in the allocation formula. Research has a consistently significant positive effect on cost, using any of the case-mix measures. Adjusting for both education and research within the regression framework would ensure that appropriate recognition is given to the effect of academic affiliations on patient care costs.

MEDICARE RELIANCE

We believe VERA should be modified to adjust for differences in the degree to which VA patients rely on Medicare providers for the care they receive. Although adjusting for Medicare reliance will undoubtedly increase the system's complexity, it will also make the system more equitable. Adjusting for Medicare reliance might also help

mitigate the potential for VISNs to receive additional revenue for treating patients who receive the bulk of their care through Medicare providers, in the event that the VA adopted a case-mix measure, such as DCGs, that assigned patients to cost categories based solely on diagnoses.

OTHER VARIABLES

With the exception of the case-mix variables, the variables in the individual-level policy model (e.g., age, sex, urban or rural location, Medicare reliance, and Medicaid long-term care generosity) add little incremental explanatory power, overall, once case mix is taken into account. However, these non-case-mix variables are statistically significant (see Table 3.2); there are sound conceptual reasons for including them in the model; and they have a substantial impact on the simulated allocations (see comparison between the base case simulation and the VERA-3 policy model simulation in Table 3.5). Therefore, we recommend that the VA include them.

PRIORITY 7 PATIENTS

An issue of ongoing interest to the VA, veterans groups, and the Congress is whether Basic Care Priority 7 patients should be included in workload calculations. When addressing this issue, decisionmakers must assess how patient care resources would be redistributed across priority groups, how the economic incentives facing VISN directors and facility managers would be altered, how waiting times and appointment backlogs might be affected, and possibly even how the quality of care offered to veterans could change. Such assessments would become especially crucial if a decision to include the Basic Care Priority 7 patients were not accompanied by a larger medical care appropriation and/or enrollment reforms.

Although our analysis does not point to a clear recommendation regarding whether Basic Care Priority 7 patients should be included in workload calculations, it does illustrate how VISN allocations would have been altered in 2002 had the VA decided to include these patients in their workload calculations. Here, in comparing the sets of simulation results with and without the Basic Care Priority 7 patients, it is important to remember that VERA is a zero-sum game. Consequently, if the VA were to decide to include Basic Care Priority 7 patients in workload calculations, then some VISNs would gain revenue at the expense of other VISNs, assuming that Congress does not increase the medical care appropriation to take greater account of the costs of treating those patients.

STUDY LIMITATIONS

In considering our findings, the reader should keep the study's limitations in mind.

First, while we had an enormous amount of patient-level data at our disposal—nearly four million patient records—the facility data set, with just 143 observations, was quite small. The small number of facility observations may have limited our ability to detect particular effects.

Second, although the analysis generated insight into factors that explain variation in patient-level costs, we are unable to compare, for example, the average cost per patient to any sort of efficiency "gold standard." In other words, we have no way of knowing what the "right" costs should be for any given patient. Rather, we are able to compare only how costs vary for patients and facilities with different characteristics. This problem is exacerbated by the fact that the necessary data are not available to adjust our cost data to reflect differences in quality of care across facilities and VISNs.

Finally, the validity of our analysis ultimately depends to a great extent on the completeness and quality of the data that were used to construct the patient and facility equations. In general, we found the patient-level data to be quite complete, with the exception of certain variables such as income. While we did not attempt to validate a sample of the patient data against data drawn from patients' medical records, we did conduct a variety of reliability and validation checks using data from multiple years on the same set of patients. From what we could determine, the patient-level data appeared to be of very high quality.

However, we believe that the quality and completeness of the facility data could be improved. To some extent, the problems that we encountered in the facility data set were due to the large number of management consolidations that occurred over the last half dozen years or so. Often, we ran into difficulty obtaining data on all measures for the same set of facilities. We believe that if the VA chooses to adopt an allocation methodology that adjusts for facility-level characteristics, such as our regression/simulation approach, the quality of the facility data collection process should be improved. Specifically, the definition of what constitutes a facility should be developed (e.g., a management unit or physical location) and applied consistently throughout the data collection process.

UTILITY OF THE MODEL

In closing, we believe that in addition to generating important insights into the factors that influence the costs of providing care to the veteran population—with an emphasis on those factors expressed by Congress in the legislation mandating the study—our modeling approach provides VA policymakers with a valuable tool for making resource allocation decisions. The tool is both comprehensive, in the sense that it adjusts for a large number of patient and facility variables, and flexible, in that predicted costs could be aggregated in many different ways. Although we presented simulation results for a specific set of models and scenarios in this report, in reality, the tool can be used to conduct a much wider array of simulations, where particular variables are included or excluded from the patient- and/or facility-level regression equations, specific values are assigned to variables, and so on. Moreover, as mentioned earlier, apart from using the model to simulate VISN allocations under various policies, it can also be used by VISN directors in making allocations to facilities and by VA headquarters staff in the allocation adjustment, or supplemental, process.

To maintain the policy relevance of the model, it must be updated and refined on an ongoing basis. Two such refinements include incorporating more-recent VA and

Medicare data as they become available and incorporating quality and access measures as well. Moreover, to preserve the VA's objective of allocating resources in as equitable and simplistic a manner as possible, additional analyses are required to better understand why various adjustments lead to relatively large swings in VISN allocations and to explicate more clearly the set of "prices" that each VISN will face for treating different types of patients. Over the next year, RAND staff will be working with the VA to refine the model and to determine the impact of controlling for additional variables on VISN allocations.

Appendix A

KEY FORMULAS AND DATA IN THE FY 2002 VERA

In FY 2002, VERA allocated close to $16.9 billion to cover the costs of patient care, including up-front adjustments for five networks totaling over $267 million. Adjustments were made for networks with projected expenditures greater than projected revenues.

In addition $1.4 billion was allocated to support research, education, equipment purchases and NRM expenses. Research allocations to the networks for FY 2002 were based on the amount of research funded in FY 2000. Education support is allocated on the basis of the number of approved residents. Equipment and NRM funds are allocated strictly on the basis of workload. NRM is adjusted for geographic differences in construction costs. Table A.1 explains the formulas used to allocate VERA funds in FY 2002.

Table A.1

Key Formulas and Data in the FY 2002 VERA

Allocation Factors	Total Dollars Allocated	Mechanism to Determine Total Dollars	Definitions Of Workload (Unit of Measure)	National Total Workload (Unit of Measure)	National Price/ Allocation Rate
Basic Vested Care	$10,148,273,755	61.25% of Basic Care (Vested and Non-Vested) and Complex Care dollars. Percentage updated based on FY 2000 cost experience	Number of Basic Care patients in the three-year Cat A/X user file. Three-year file includes FY 1998, 1999, and 2000 patients who rely on VA for their care. These patients have used inpatient services or have had an appropriate detailed medical evaluation during the past three years. Includes compensation and pension exam visits. Workload units based on historical utilization are adjusted to reflect care across networks.	3,251,103	$3,121 per basic workload unit
Basic Non-Vested Care	$78,156,587	0.32% of Basic Care (Vested and Non-Vested) and Complex Care. Percentage updated based on FY 2000 cost experience.	Number of Basic Care patients in the three-year Cat A/X user file who use some VA health care services but are less reliant on the VA system. Excludes compensation and pension exam patients. Excludes all collateral visits. Workload units based on historical utilization are adjusted to reflect care across networks.	396,188	$197 per non-vested patient
Complex Care	$6,381,534,658	38.42% of Basic Care (Vested and Non-Vested) and Complex Care dollars (Same % as previous years)	Number of Complex Care patients forecasted to use the VISN in FY 2002. This one-year forecasted number is based on historical utilization over five years (FY 1996–2000). Workload units based on historical utilization are adjusted to reflect care across networks. The forecast continues to include a factor for age, but no longer for veteran population trends.	153,155	$41,667 per complex workload unit

Table A.1—continued

Allocation Factors	Total Dollars Allocated	Mechanism to Determine Total Dollars	Definitions of Workload (Unit of Measure)	National Total Workload (Unit of Measure)	National Price/ Allocation Rate
Geographic price adjustment	$0	The geographic price adjustment (labor index) is applied against 12.9 billion labor dollars expended in FY 2000.	The FY 2002 VERA labor index is computed using four pay periods of FY 2000 normal pay data only and a national market basket methodology. For FY 2002, the labor index is unchanged. REVISED: Adjustment created to account for local cost of living factors associated with procuring contracted labor and non-labor contracted goods such as energy-related products, utilities, and provisions.		
Research support	$386,938,000	Total of research support dollars in the FY 2002 president's budget	Dollars of FY 2000 funded research (intra- and extra-mural research). Applied weights: 100% for VA-administered research; 75% for peer-reviewed research that is not VA administered; 25% for non-peer reviewed research that is not VA administered.	$784,993,066 unweighted; $666,898,966 weighted	$0.58 per dollar of reported funded research
Education support	$362,202,000	Total of education support dollars in the FY 2002 president's budget	Number of residents for academic year 2001/2002.	8,669	$41,781 per resident
Subtotal	$17,357,105,000				
Equipment-capitation	$426,241,000	Total of equipment dollars in the FY 2002 medical care budget	The equipment allocation is based totally on workload (sum of Basic Vested, Basic Non-Vested, and Complex Care workload)	3,800,446 PRPs (prorated patients) (Basic Vested, Basic Non-Vested plus Complex Care PRPs)	$112

Table A.1—continued

Allocation Factors	Total Dollars Allocated	Mechanism to Determine Total Dollars	Definitions of Workload (Unit of Measure)	National Total Workload (Unit of Measure)	National Price/ Allocation Rate
NRM-Boeckh Index times total workload (new model)	$258,307,000	Derived from non-recurring maintenance dollars in the FY 2002 medical care budget	The NRM allocation is based on workload adjusted by the Boeckh Index (Workload (PRPs) times Boeckh Index). The Boeckh Index is an external inflation index that measures the relative cost of building and/or renovating space.	70,564 units—sum of (Network, PRPs times Network Boeckh Index)	$3,661
Total capital amounts	$684,548,000	Derived from FY 2002 medical care budget			
VERA adjustments	$267,349,000	Comparison of expected expenditures to projected revenues including VERA allocations	5 networks received adjustments: 1 ($41.3M); 3 ($128.5M); 12 ($20.8M); 13 ($43.9M); 14 ($32.9M)		
Total $ General Purpose	$18,309,002,000	Derived from FY 2002 medical care budget less Specific Purpose funding plus VERA adjustments			

SOURCE: *Veterans Equitable Resource Allocation System,* Sixth Edition, Washington, D.C.: Department of Veterans Affairs, March 2002.

NOTES: Cat A/X: Category A includes veterans with service-connected conditions and low-income veterans with non-service-connected conditions; Category X includes veterans with exposure to Agent Orange, radiation, etc.

Appendix B

VERA PATIENT CLASSES

Table B.1 compares the patient health status classes used by the three VERA-based risk adjustment systems: VERA-47; VERA-10; and the current system, VERA-3.

Table B.1

Comparison of VERA Patient Classes Health Status

VERA-47	VERA-10	VERA-3
1. Pharmacy	Non-reliant care	Non-funded
2. Employee/collaterals	Non-reliant care	Non-funded
3. Non-Vested patient	Non-reliant care	Basic Non-Vested
4. Compensation and pension (C&P) exam	Non-reliant care	Basic Vested
5. Musculoskeletal disorder	Minor medical	Basic Vested
6. Other acute diseases	Minor medical	Basic Vested
7. Ear, nose, and throat	Minor medical	Basic Vested
8. Endocrine nutritional metabolic disorder	Minor medical	Basic Vested
9. Central nervous system	Minor medical	Basic Vested
10. Acute mental disease	Mental health	Basic Vested
11. Addictive disorders	Mental health	Basic Vested
12. Cardiovascular disease	Heart and lung	Basic Vested
13. Gastroenterology	Heart and lung	Basic Vested
14. Pulmonary disease	Heart and lung	Basic Vested
15. HIV+ without anti-retroviral therapy	Oncology, etc.	Basic Vested
16. Oncology	Oncology, etc.	Basic Vested
17. Hepatitis C, basic	Oncology, etc.	Basic Vested
18. Medical/psych+substance abuse	Multiple problems	Basic Vested
19. Psych+substance abuse	Multiple problems	Basic Vested
20. Hepatitis C, complex	Multiple problems	Complex Care
21. Post-traumatic stress disorder (PTSD)—acute	Multiple problems	Basic Vested
22. Multiple medical	Multiple problems	Basic Vested
23. HIV+ with anti-retroviral therapy	Specialized care	Complex Care
24. PTSD—chronic	Specialized care	Complex Care
25. Traumatic brain injury	Specialized care	Complex Care

VERA-47	VERA-10	VERA-3
26. Long-term care (LTC): home-based primary care (HBPC)	Specialized care	Complex Care
27. Stroke	Supportive care	Complex Care
28. Spinal cord injury para—old injury	Supportive care	Complex Care
29. LTC: domiciliary	Supportive care	Complex Care
30. Spinal cord injury quad—old injury	Supportive care	Complex Care
31. Blind rehab	Supportive care	Complex Care
32. LTC: community nursing home	Supportive care	Complex Care
33. LTC: low activities of daily living (ADL)	Supportive care	Complex Care
34. Substance abuse	Chronically mentally ill	Complex Care
35. Mental health intensive care management	Chronically mentally ill	Complex Care
36. Schizophrenia and dementia	Chronically mentally ill	Complex Care
37. Other psychosis	Chronically mentally ill	Complex Care
38. Spinal cord injury para—new injury	Critically ill	Complex Care
39. LTC: behavioral	Critically ill	Complex Care
40. LTC: clinical complex	Critically ill	Complex Care
41. Spinal cord injury quad—new injury	Critically ill	Complex Care
42. LTC: physical	Critically ill	Complex Care
43. LTC: rehabilitation	Critically ill	Complex Care
44. End-stage renal disease (ESRD)	Critically ill	Complex Care
45. Transplant	Critically ill	Complex Care
46. LTC: specialized care	Critically ill	Complex Care
47. LTC: ventilator dependent	Critically ill	Complex Care

SOURCES: VA Allocation Resource Center (ARC), VERA 2000 Veterans Equitable Resource Allocation System, "Patient Classification Chapter," *ARC Technical Manual,* Braintree, Mass.: VA Allocation Resource Center, June 2000; *Veterans Equitable Resource Allocation System,* Sixth Edition, Washington, D.C.: Department of Veterans Affairs, March 2002.

Appendix C

VISN-LEVEL PATIENT VARIABLES AND DESCRIPTIVE STATISTICS FOR THE FY 2000 VHA PATIENT POPULATION

Tables C.1 and C.2 describe the characteristics of the VHA patient population and facilities by VISN for fiscal year 2000. Table C.1 shows the size, demographic characteristics, and other patient-level variables for the patient population. Table C.2 describes the facility-level characteristics. Chapter Two Tables 2.1 and 2.2 show which variables were included in the policy model.

Table C.1

VISN-Level Descriptives, Patient Variables

VISN	Number of Individuals	Age								
		Missing	Under 25	25 to 34	35 to 44	45 to 54	55 to 64	65 to 74	75 to 84	85 or older
01 Boston	140,459	1.4%	0.7%	3.8%	8.0%	20.9%	14.7%	24.7%	23.4%	2.3%
02 Albany	87,586	1.6%	1.0%	4.4%	9.2%	19.4%	14.1%	24.6%	23.6%	2.3%
03 Bronx	132,097	1.2%	0.6%	3.3%	8.2%	18.7%	13.9%	25.1%	26.0%	3.0%
04 Pittsburgh	172,609	1.4%	0.7%	3.6%	8.3%	19.8%	15.0%	26.1%	23.3%	1.9%
05 Baltimore	83,276	1.3%	0.7%	4.9%	12.9%	23.6%	14.6%	22.2%	18.0%	1.9%
06 Durham	152,560	2.0%	0.8%	5.4%	11.9%	24.3%	16.1%	21.9%	16.3%	1.4%
07 Atlanta	186,677	2.1%	0.7%	5.1%	12.5%	24.7%	16.3%	21.7%	15.6%	1.3%
08 Bay Pines	279,057	1.3%	0.6%	3.7%	9.0%	20.1%	17.1%	25.2%	20.8%	2.1%
09 Nashville	155,945	1.5%	0.8%	4.8%	10.2%	23.8%	16.8%	23.2%	17.4%	1.6%
10 Cincinnati	109,081	1.7%	0.7%	4.6%	11.3%	23.2%	14.9%	23.0%	19.2%	1.5%
11 Ann Arbor	127,748	1.5%	0.7%	4.8%	10.3%	22.7%	15.2%	23.4%	20.0%	1.5%
12 Chicago	125,734	1.3%	1.0%	4.6%	10.0%	20.9%	14.7%	23.6%	21.8%	2.1%
13 Minneapolis	82,099	2.0%	0.7%	4.0%	8.2%	20.5%	14.6%	25.3%	22.3%	2.4%
14 Lincoln	59,760	1.4%	0.8%	4.4%	9.3%	19.8%	14.5%	25.6%	22.0%	2.2%
15 Kansas City	131,598	1.4%	0.6%	4.0%	10.0%	22.5%	16.0%	24.5%	19.2%	1.8%
16 Jackson	282,713	1.9%	0.7%	4.7%	9.9%	24.0%	17.8%	22.9%	16.6%	1.6%
17 Dallas	146,699	1.8%	1.1%	5.7%	11.1%	23.9%	17.3%	21.1%	16.4%	1.8%
18 Phoenix	143,268	1.1%	0.8%	4.6%	9.4%	22.1%	17.7%	23.5%	18.9%	2.0%
19 Denver	87,858	1.8%	1.0%	5.4%	10.4%	23.6%	16.8%	21.5%	17.8%	1.6%
20 Portland	138,749	2.3%	1.1%	6.2%	11.8%	26.1%	17.2%	18.6%	15.3%	1.5%
21 San Francisco	139,667	1.7%	0.8%	4.2%	9.4%	24.8%	17.5%	20.4%	18.9%	2.3%
22 Long Beach	168,276	1.3%	1.4%	6.0%	12.2%	24.9%	19.2%	19.0%	14.4%	1.7%

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Table C.1—continued

VISN	Income (in thousands)						Race/ethnicity					
	Missing	$20 or less	$21 to $40	$41 to $60	$61 to $80	Greater than $80	Missing	Hispanic	Native American	Black	Asian	White
01 Boston	11.0%	56.8%	25.7%	3.9%	1.2%	1.5%	33.2%	1.1%	0.1%	3.7%	0.1%	61.8%
02 Albany	15.4%	55.8%	22.6%	3.6%	1.1%	1.4%	31.5%	0.6%	0.1%	6.4%	0.0%	61.4%
03 Bronx	19.6%	53.5%	20.6%	3.2%	1.1%	1.9%	29.7%	5.7%	0.1%	18.1%	0.3%	46.2%
04 Pittsburgh	14.0%	55.5%	24.1%	3.9%	1.1%	1.5%	34.9%	0.5%	0.0%	10.9%	0.1%	53.6%
05 Baltimore	18.9%	54.1%	20.0%	3.6%	1.5%	1.9%	34.4%	0.7%	0.1%	27.8%	0.1%	37.0%
06 Durham	11.1%	56.8%	25.1%	4.5%	1.5%	1.1%	35.0%	0.5%	0.2%	18.8%	0.1%	45.5%
07 Atlanta	12.8%	59.8%	21.6%	3.5%	1.2%	1.1%	32.1%	0.4%	0.1%	25.6%	0.1%	41.8%
08 Bay Pines	10.3%	61.7%	22.7%	3.2%	1.0%	1.2%	28.0%	20.7%	0.1%	7.4%	0.1%	43.8%
09 Nashville	12.3%	61.1%	21.6%	3.1%	0.9%	0.9%	24.1%	0.3%	0.1%	12.1%	0.0%	63.4%
10 Cincinnati	12.7%	60.7%	21.7%	3.2%	0.9%	0.9%	32.2%	0.6%	0.0%	14.7%	0.0%	52.5%
11 Ann Arbor	14.2%	60.3%	20.2%	3.2%	1.0%	1.2%	25.9%	0.5%	0.1%	14.7%	0.1%	58.8%
12 Chicago	12.8%	59.5%	21.5%	3.7%	1.1%	1.4%	28.1%	1.3%	0.2%	19.6%	0.2%	50.6%
13 Minneapolis	13.4%	57.5%	21.8%	4.1%	1.2%	2.0%	40.7%	0.3%	1.4%	1.8%	0.0%	55.7%
14 Lincoln	11.3%	59.8%	22.6%	4.2%	1.0%	1.1%	34.7%	0.5%	0.2%	3.5%	0.0%	61.2%
15 Kansas City	10.9%	59.9%	23.1%	3.8%	1.1%	1.2%	30.2%	0.6%	0.1%	9.5%	0.0%	59.6%
16 Jackson	11.7%	61.8%	21.8%	2.9%	0.9%	0.9%	26.9%	1.1%	0.4%	19.3%	0.1%	52.2%
17 Dallas	14.0%	59.8%	21.0%	3.1%	1.1%	1.0%	28.8%	11.2%	0.1%	12.0%	0.1%	47.7%
18 Phoenix	10.6%	59.0%	23.7%	4.0%	1.3%	1.4%	27.7%	10.9%	1.4%	4.1%	0.3%	55.6%
19 Denver	13.6%	56.3%	23.2%	4.1%	1.3%	1.5%	27.5%	4.7%	0.5%	3.8%	0.2%	63.3%
20 Portland	13.6%	59.9%	21.4%	3.1%	1.0%	1.0%	38.6%	1.1%	0.6%	4.7%	1.0%	54.0%
21 San Francisco	14.5%	56.5%	22.5%	3.5%	1.3%	1.6%	32.7%	3.7%	0.3%	9.5%	5.9%	48.0%
22 Long Beach	18.6%	59.4%	17.1%	2.6%	1.0%	1.2%	42.1%	5.5%	0.2%	11.2%	1.2%	39.9%

RAND*MR1629-TC.1b*

Table C.1—continued

VISN	Gender			Marital Status				# of MDs per Capita			
	Missing	Female	Male	Missing	Single	Married	ARF Variables Missing	Less than 0.001	0.001 to 0.002	0.0021 to 0.003	Greater than 0.003
01 Boston	0.0%	4.2%	95.8%	3.8%	45.8%	50.4%	0.1%	2.7%	25.8%	25.0%	46.4%
02 Albany	0.0%	4.4%	95.5%	4.7%	43.6%	51.8%	0.0%	17.7%	30.5%	13.4%	38.4%
03 Bronx	0.0%	2.9%	97.1%	3.4%	50.3%	46.3%	0.1%	1.0%	9.3%	39.2%	50.4%
04 Pittsburgh	0.0%	3.8%	96.2%	4.1%	42.0%	53.9%	0.1%	17.1%	31.0%	24.4%	27.6%
05 Baltimore	0.1%	6.1%	93.9%	5.8%	50.2%	44.1%	0.1%	13.5%	20.8%	36.4%	29.2%
06 Durham	0.0%	6.2%	93.8%	5.2%	38.8%	56.0%	0.0%	38.3%	31.5%	14.7%	15.4%
07 Atlanta	0.0%	6.0%	94.0%	5.2%	40.5%	54.4%	0.1%	35.9%	24.7%	17.7%	21.6%
08 Bay Pines	0.0%	4.8%	95.2%	5.0%	37.1%	58.0%	4.9%	21.5%	24.7%	32.5%	16.5%
09 Nashville	0.0%	4.3%	95.6%	4.9%	38.7%	56.5%	0.0%	42.9%	22.0%	3.6%	31.5%
10 Cincinnati	0.0%	4.4%	95.6%	4.1%	47.9%	47.9%	0.0%	27.7%	22.8%	13.4%	36.1%
11 Ann Arbor	0.0%	4.3%	95.7%	4.4%	47.9%	47.8%	0.0%	34.1%	18.5%	26.8%	20.6%
12 Chicago	0.0%	4.4%	95.6%	4.4%	50.1%	45.5%	0.0%	21.2%	18.3%	9.3%	51.2%
13 Minneapolis	0.0%	4.4%	95.6%	8.4%	39.0%	52.7%	0.1%	44.1%	17.3%	14.2%	24.4%
14 Lincoln	0.0%	4.5%	95.5%	4.7%	41.9%	53.4%	0.0%	43.6%	21.5%	23.0%	11.9%
15 Kansas City	0.0%	4.2%	95.8%	3.8%	41.9%	54.3%	0.0%	48.3%	20.1%	17.9%	13.7%
16 Jackson	0.0%	4.9%	95.1%	6.0%	38.9%	55.1%	0.1%	35.5%	18.2%	19.5%	26.8%
17 Dallas	0.0%	6.1%	93.9%	7.1%	38.0%	54.9%	0.0%	37.2%	15.3%	13.5%	34.0%
18 Phoenix	0.0%	5.5%	94.5%	3.9%	40.7%	55.5%	0.1%	21.8%	27.4%	25.9%	24.8%
19 Denver	0.1%	5.9%	94.0%	6.4%	41.4%	52.2%	0.1%	21.5%	29.9%	33.3%	15.2%
20 Portland	0.1%	6.4%	93.6%	7.1%	43.7%	49.2%	0.1%	16.6%	32.0%	36.4%	15.0%
21 San Francisco	0.1%	5.3%	94.6%	4.3%	49.9%	45.8%	0.3%	11.8%	28.8%	35.6%	23.5%
22 Long Beach	0.0%	5.4%	94.6%	5.8%	56.0%	38.3%	0.1%	2.7%	34.6%	61.3%	1.4%

RAND*MR1629-TC.1c*

Table C.1—continued

VISN	# of Beds per Capita			Rural/Urban Residence				
	Less than 0.003	0.003 to 0.006	Greater than 0.006	Missing	Urban	Suburban	Rural	Very Rural
01 Boston	42.5%	49.7%	7.8%	1.2%	76.2%	15.3%	6.0%	1.3%
02 Albany	19.7%	50.6%	29.6%	0.4%	72.6%	23.1%	2.7%	1.2%
03 Bronx	19.9%	64.6%	15.4%	0.7%	97.2%	1.9%	0.1%	0.1%
04 Pittsburgh	30.2%	40.0%	29.8%	0.3%	77.4%	16.1%	3.8%	2.3%
05 Baltimore	61.4%	10.6%	27.9%	0.4%	84.7%	9.2%	2.5%	3.1%
06 Durham	49.0%	31.2%	19.7%	0.2%	65.7%	20.7%	6.1%	7.3%
07 Atlanta	44.3%	27.0%	28.7%	0.3%	66.0%	23.5%	5.1%	5.1%
08 Bay Pines	28.6%	57.2%	9.3%	24.6%	62.9%	8.1%	2.1%	2.4%
09 Nashville	35.5%	42.3%	22.2%	0.2%	54.9%	17.6%	15.2%	12.1%
10 Cincinnati	41.1%	56.4%	2.5%	0.2%	78.9%	16.1%	3.9%	1.0%
11 Ann Arbor	38.4%	55.0%	6.6%	0.2%	70.4%	18.8%	6.1%	4.5%
12 Chicago	24.4%	72.6%	3.0%	0.3%	76.6%	12.7%	6.8%	3.7%
13 Minneapolis	30.5%	40.3%	29.1%	0.3%	48.7%	15.4%	20.2%	15.5%
14 Lincoln	24.7%	49.4%	25.9%	0.2%	44.4%	30.6%	14.2%	10.6%
15 Kansas City	38.9%	37.5%	23.7%	0.2%	50.4%	19.7%	19.3%	10.5%
16 Jackson	34.4%	41.7%	23.9%	0.2%	64.4%	20.4%	10.1%	4.9%
17 Dallas	43.8%	47.0%	9.2%	0.3%	74.2%	15.7%	6.0%	3.9%
18 Phoenix	61.2%	31.6%	7.2%	0.3%	69.0%	19.9%	6.3%	4.5%
19 Denver	59.6%	18.1%	22.2%	0.3%	55.6%	17.4%	17.8%	8.8%
20 Portland	61.0%	36.7%	2.3%	0.3%	66.3%	22.5%	8.0%	2.9%
21 San Francisco	68.2%	28.1%	3.4%	2.0%	81.8%	12.9%	2.3%	0.9%
22 Long Beach	61.9%	36.6%	1.5%	0.4%	97.4%	1.4%	0.5%	0.2%

RAND*MR1629-TC.1d*

Table C.1—continued

VISN	Distance to Parent Facility					Distance to Closest CBOC			
	Missing	Less than 30 Miles	31 to 100 Miles	101 to 250 Miles	Greater than 250 Miles	Missing	Less than 30 Miles	31 to 100 Miles	Greater than 100 Miles
01 Boston	3.5%	59.9%	32.7%	3.6%	0.4%	1.2%	91.2%	7.6%	0.0%
02 Albany	1.0%	27.7%	35.8%	33.7%	1.9%	0.4%	95.7%	3.9%	0.0%
03 Bronx	3.5%	81.7%	13.4%	1.2%	0.3%	0.4%	98.8%	0.8%	0.0%
04 Pittsburgh	1.0%	60.5%	36.8%	1.5%	0.2%	0.3%	91.9%	7.8%	0.0%
05 Baltimore	1.4%	71.3%	23.7%	3.1%	0.5%	0.3%	95.5%	4.3%	0.0%
06 Durham	0.4%	47.7%	44.7%	6.4%	0.7%	0.2%	38.9%	60.9%	0.0%
07 Atlanta	2.5%	40.8%	45.2%	10.7%	0.8%	0.3%	48.9%	50.8%	0.0%
08 Bay Pines	3.6%	45.0%	40.3%	10.7%	0.5%	1.3%	81.5%	17.2%	0.0%
09 Nashville	0.5%	41.6%	47.0%	10.2%	0.8%	0.2%	59.4%	40.4%	0.0%
10 Cincinnati	0.4%	56.4%	40.1%	2.6%	0.4%	0.2%	92.7%	7.1%	0.0%
11 Ann Arbor	2.4%	42.1%	43.0%	12.1%	0.4%	0.3%	60.6%	39.1%	0.0%
12 Chicago	1.9%	60.0%	29.2%	8.2%	0.7%	0.2%	86.3%	13.5%	0.0%
13 Minneapolis	2.1%	36.7%	35.7%	23.5%	2.0%	0.3%	50.3%	48.9%	0.6%
14 Lincoln	1.3%	24.2%	50.9%	22.5%	1.1%	0.3%	35.4%	64.0%	0.4%
15 Kansas City	0.5%	43.7%	44.0%	11.2%	0.7%	0.2%	69.2%	30.5%	0.0%
16 Jackson	0.5%	38.1%	46.3%	14.5%	0.7%	0.2%	34.8%	65.0%	0.1%
17 Dallas	5.0%	39.6%	36.9%	17.7%	0.8%	0.3%	71.8%	27.9%	0.0%
18 Phoenix	1.0%	44.0%	30.4%	23.2%	1.4%	0.4%	54.7%	44.5%	0.5%
19 Denver	1.1%	41.3%	28.8%	24.4%	4.5%	0.4%	69.0%	29.5%	1.2%
20 Portland	5.7%	50.7%	32.1%	9.6%	2.0%	0.8%	62.6%	35.3%	1.4%
21 San Francisco	3.5%	45.8%	34.0%	15.2%	1.5%	2.0%	72.4%	24.6%	0.9%
22 Long Beach	2.4%	60.9%	24.1%	11.7%	0.9%	0.6%	94.8%	4.5%	0.1%

RAND*MR1629-TC.1e*

Table C.1—continued

VISN	VA Priority							
	Missing	1	2	3	4	5	6	7
01 Boston	0.0%	18.9%	9.6%	16.3%	5.0%	42.3%	1.1%	6.8%
02 Albany	0.0%	12.7%	7.4%	14.1%	4.3%	52.2%	1.2%	8.1%
03 Bronx	0.0%	12.6%	7.2%	16.6%	3.6%	44.2%	0.9%	14.9%
04 Pittsburgh	0.0%	13.9%	8.1%	13.8%	4.2%	49.8%	1.1%	9.2%
05 Baltimore	0.0%	13.8%	8.5%	13.6%	4.6%	50.7%	1.4%	7.3%
06 Durham	0.0%	19.0%	11.5%	16.4%	4.9%	41.7%	1.4%	5.1%
07 Atlanta	0.0%	15.8%	10.0%	15.9%	5.6%	45.0%	1.3%	6.4%
08 Bay Pines	0.0%	17.1%	8.8%	15.6%	5.0%	47.7%	1.1%	4.9%
09 Nashville	0.0%	16.1%	9.3%	14.2%	5.5%	48.4%	1.2%	5.4%
10 Cincinnati	0.0%	11.8%	7.8%	13.6%	5.0%	55.3%	1.2%	5.3%
11 Ann Arbor	0.0%	11.8%	7.9%	14.0%	4.8%	53.4%	1.2%	7.0%
12 Chicago	0.0%	11.8%	7.1%	12.8%	6.9%	53.1%	1.2%	7.2%
13 Minneapolis	0.0%	15.2%	9.0%	16.0%	5.2%	41.7%	2.1%	10.7%
14 Lincoln	0.0%	13.4%	8.4%	13.7%	5.6%	51.5%	1.1%	6.3%
15 Kansas City	0.0%	12.5%	7.9%	13.2%	5.8%	53.0%	1.6%	6.3%
16 Jackson	0.0%	16.5%	8.8%	13.4%	5.7%	49.6%	1.2%	4.8%
17 Dallas	0.0%	18.7%	10.9%	17.4%	4.5%	42.0%	1.7%	4.7%
18 Phoenix	0.0%	17.1%	9.8%	15.7%	3.8%	45.8%	1.5%	6.3%
19 Denver	0.0%	17.6%	10.0%	15.2%	4.5%	44.9%	1.3%	6.6%
20 Portland	0.0%	21.1%	11.5%	16.5%	5.4%	39.1%	1.1%	5.3%
21 San Francisco	0.0%	17.9%	9.8%	15.4%	4.0%	46.2%	1.3%	5.4%
22 Long Beach	0.0%	13.1%	8.4%	14.4%	4.0%	52.7%	1.1%	6.2%

RAND*MR1629-TC.1f*

Table C.1—continued

VISN	Medicare Reliance						
	Missing	None	Less than 25%	25 to 50%	51 to 75%	More than 75%	Medicare Reliance Imputed
01 Boston	49.0%	16.3%	10.4%	5.1%	6.2%	12.9%	8.5%
02 Albany	49.0%	17.3%	12.0%	5.4%	6.2%	10.2%	5.7%
03 Bronx	49.7%	14.9%	7.6%	4.9%	6.7%	16.3%	10.0%
04 Pittsburgh	51.7%	12.4%	8.6%	4.8%	6.3%	16.3%	10.3%
05 Baltimore	59.8%	16.4%	7.6%	3.6%	4.0%	8.6%	4.5%
06 Durham	56.8%	14.9%	11.3%	4.9%	4.6%	7.6%	1.5%
07 Atlanta	58.2%	14.0%	9.7%	4.8%	4.9%	8.3%	1.7%
08 Bay Pines	54.3%	14.7%	7.9%	4.8%	6.3%	12.0%	8.3%
09 Nashville	54.7%	16.4%	11.7%	4.9%	4.7%	7.5%	1.4%
10 Cincinnati	56.6%	13.3%	8.9%	4.4%	5.4%	11.5%	7.4%
11 Ann Arbor	53.2%	15.6%	10.7%	5.1%	5.5%	10.0%	2.7%
12 Chicago	51.2%	17.7%	10.6%	4.8%	5.4%	10.3%	5.3%
13 Minneapolis	50.0%	18.0%	13.6%	4.7%	4.8%	9.0%	2.4%
14 Lincoln	50.1%	15.0%	14.1%	5.9%	5.8%	9.2%	1.8%
15 Kansas City	51.9%	17.2%	11.3%	5.1%	5.2%	9.4%	3.3%
16 Jackson	56.8%	15.0%	9.5%	4.2%	4.7%	9.7%	4.4%
17 Dallas	61.1%	14.1%	7.8%	3.5%	4.3%	9.2%	5.7%
18 Phoenix	55.1%	16.5%	9.0%	4.2%	5.2%	10.0%	7.5%
19 Denver	56.1%	15.3%	10.4%	4.7%	5.0%	8.5%	5.1%
20 Portland	61.6%	15.1%	8.4%	3.4%	4.1%	7.4%	6.0%
21 San Francisco	58.3%	15.6%	7.3%	3.6%	4.9%	10.4%	9.0%
22 Long Beach	64.5%	11.9%	4.5%	2.7%	4.3%	12.1%	12.1%

RAND*MR1629-TC.1g*

Table C.1—continued

VISN	Medicaid Variables Missing	General Medicaid Generosity				Generosity of Medicaid LTC			
		1st Quartile (lowest)	2nd Quartile	3rd Quartile	4th Quartile (highest)	1st Quartile (lowest)	2nd Quartile	3rd Quartile	4th Quartile (highest)
01 Boston	1.1%	0.4%	1.5%	6.6%	90.3%	0.4%	1.7%	6.5%	90.3%
02 Albany	0.4%	0.4%	1.1%	3.0%	95.1%	0.4%	1.3%	0.7%	97.2%
03 Bronx	0.7%	0.5%	1.5%	1.2%	96.1%	0.5%	1.7%	26.9%	70.2%
04 Pittsburgh	0.3%	0.4%	0.9%	86.1%	12.3%	0.4%	10.2%	12.3%	76.9%
05 Baltimore	0.3%	0.6%	16.1%	70.6%	12.3%	14.4%	68.4%	13.0%	3.9%
06 Durham	0.2%	0.5%	39.9%	58.7%	0.6%	39.0%	59.4%	0.8%	0.6%
07 Atlanta	0.2%	28.9%	69.2%	1.1%	0.5%	30.7%	67.9%	0.8%	0.5%
08 Bay Pines	20.0%	0.6%	75.4%	1.5%	2.5%	0.5%	75.6%	1.3%	2.5%
09 Nashville	0.2%	1.1%	52.0%	44.2%	2.6%	7.2%	13.1%	77.4%	2.1%
10 Cincinnati	0.2%	0.6%	0.9%	7.2%	91.2%	0.4%	1.4%	6.4%	91.7%
11 Ann Arbor	0.2%	0.7%	0.9%	92.6%	5.6%	0.5%	1.1%	92.6%	5.6%
12 Chicago	0.3%	0.9%	0.9%	63.0%	35.0%	0.7%	1.1%	63.3%	34.7%
13 Minneapolis	0.3%	1.1%	1.7%	3.0%	93.9%	0.7%	0.8%	36.6%	61.6%
14 Lincoln	0.2%	1.1%	1.6%	48.0%	49.1%	0.8%	1.8%	96.5%	0.8%
15 Kansas City	0.2%	1.5%	22.8%	25.9%	49.6%	1.3%	24.9%	73.3%	0.4%
16 Jackson	0.2%	41.1%	39.3%	16.5%	2.8%	51.0%	45.3%	3.1%	0.4%
17 Dallas	0.2%	97.3%	0.9%	0.9%	0.8%	96.9%	1.3%	0.9%	0.7%
18 Phoenix	0.3%	95.2%	1.2%	2.0%	1.2%	93.5%	2.5%	1.7%	2.1%
19 Denver	0.3%	22.2%	31.7%	44.4%	1.4%	2.2%	20.9%	33.4%	43.3%
20 Portland	0.2%	79.4%	12.1%	7.8%	0.5%	1.1%	33.6%	57.4%	7.7%
21 San Francisco	2.0%	86.2%	9.2%	1.0%	1.7%	10.0%	76.6%	9.8%	1.7%
22 Long Beach	0.4%	97.1%	0.9%	0.9%	0.7%	14.9%	82.8%	1.1%	0.8%

RAND*MR1629-TC.1h*

Table C.2

VISN-Level Descriptives, Facility Variables

VISN	Number of Facilities	Rural/Urban Location				VA Labor Index	Average Food Cost per Bed Day	Energy Price	Contract Labor Costs
		Urban	Suburban	Rural	Very Rural				
01 Boston	8	75.0%	12.5%	12.5%	0.0%	1.025	9.231	10.164	0.053
02 Albany	5	80.0%	20.0%	0.0%	0.0%	0.982	7.472	10.000	0.043
03 Bronx	6	100.0%	0.0%	0.0%	0.0%	1.075	6.645	9.820	0.033
04 Pittsburgh	10	90.0%	10.0%	0.0%	0.0%	0.997	6.479	8.714	0.053
05 Baltimore	3	100.0%	0.0%	0.0%	0.0%	1.034	6.051	10.367	0.097
06 Durham	8	87.5%	12.5%	0.0%	0.0%	0.974	5.931	9.113	0.041
07 Atlanta	8	87.5%	12.5%	0.0%	0.0%	0.971	6.121	8.251	0.051
08 Bay Pines	6	100.0%	0.0%	0.0%	0.0%	0.956	6.226	9.997	0.034
09 Nashville	7	100.0%	0.0%	0.0%	0.0%	0.968	5.676	8.149	0.035
10 Cincinnati	5	80.0%	0.0%	20.0%	0.0%	1.000	4.655	8.540	0.082
11 Ann Arbor	7	71.4%	28.6%	0.0%	0.0%	1.000	6.982	7.950	0.037
12 Chicago	7	71.4%	14.3%	14.3%	0.0%	1.030	6.154	8.361	0.040
13 Minneapolis	5	80.0%	20.0%	0.0%	0.0%	1.005	5.184	7.942	0.055
14 Lincoln	4	75.0%	25.0%	0.0%	0.0%	0.973	3.138	7.965	0.060
15 Kansas City	7	71.4%	14.3%	14.3%	0.0%	0.969	8.410	8.661	0.058
16 Jackson	10	90.0%	10.0%	0.0%	0.0%	0.978	5.916	7.048	0.050
17 Dallas	3	100.0%	0.0%	0.0%	0.0%	0.960	5.018	6.650	0.048
18 Phoenix	7	71.4%	14.3%	0.0%	14.3%	0.957	4.462	8.947	0.043
19 Denver	7	42.9%	28.6%	14.3%	14.3%	0.986	6.010	7.737	0.066
20 Portland	8	75.0%	25.0%	0.0%	0.0%	0.999	6.899	7.723	0.063
21 San Francisco	7	100.0%	0.0%	0.0%	0.0%	1.121	7.622	9.763	0.091
22 Long Beach	5	100.0%	0.0%	0.0%	0.0%	1.035	7.171	9.474	0.079

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Table C.2—continued

VISN	Average Building Age as of 2001	Average Building Condition (1 to 5)	Ratio of Historic to Total Number of Buildings	Total Number of Buildings	Indicator for Recent Facility Consolidation	Occupancy Rate	Number of CBOCs per 1000 Uniques
01 Boston	52.167	2.071	0.241	43.250	0.250	0.851	0.263
02 Albany	57.200	3.320	0.421	27.000	0.200	0.797	0.160
03 Bronx	43.500	3.183	0.239	38.000	0.333	0.786	0.178
04 Pittsburgh	47.600	3.297	0.139	24.300	0.100	0.751	0.217
05 Baltimore	45.222	3.056	0.044	92.333	0.333	0.852	0.189
06 Durham	45.500	3.313	0.241	28.250	0.000	0.828	0.093
07 Atlanta	43.000	3.600	0.265	24.375	0.125	0.771	0.079
08 Bay Pines	23.167	3.772	0.000	18.333	0.167	0.796	0.127
09 Nashville	43.714	3.393	0.257	27.143	0.000	0.772	0.122
10 Cincinnati	48.533	3.240	0.243	39.800	0.000	0.675	0.145
11 Ann Arbor	45.214	3.193	0.393	43.286	0.143	0.809	0.140
12 Chicago	51.071	3.257	0.179	39.714	0.143	0.821	0.198
13 Minneapolis	53.400	3.790	0.242	45.000	0.200	0.800	0.266
14 Lincoln	45.000	3.675	0.181	31.500	0.500	0.863	0.052
15 Kansas City	40.929	3.414	0.228	37.143	0.143	0.789	0.179
16 Jackson	43.250	3.105	0.202	27.000	0.000	0.827	0.092
17 Dallas	39.056	3.139	0.292	71.333	1.000	0.771	0.168
18 Phoenix	40.143	3.614	0.260	27.000	0.000	0.674	0.194
19 Denver	55.071	3.300	0.304	41.000	0.143	0.850	0.261
20 Portland	49.563	3.138	0.217	39.750	0.125	0.821	0.136
21 San Francisco	29.048	3.462	0.058	27.571	0.143	0.666	0.139
22 Long Beach	20.700	3.680	0.075	30.600	0.200	0.751	0.122

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Table C.2—continued

VISN	Special Program Beds per 1000 Uniques	Residents per Full-time MD	Square Feet of Building Space per Unique	Square Feet of Building Space per Acre of Land	Leased Square Feet per Unique
01 Boston	0.288	0.573	42.894	8.845	0.987
02 Albany	0.000	0.419	29.763	21.611	0.892
03 Bronx	0.588	0.680	46.742	47.245	0.466
04 Pittsburgh	0.000	0.479	30.374	14.172	0.316
05 Baltimore	0.000	0.641	45.468	10.379	0.642
06 Durham	0.743	0.536	34.789	14.003	0.470
07 Atlanta	0.457	0.671	39.691	36.867	0.938
08 Bay Pines	0.404	0.531	21.556	20.711	1.916
09 Nashville	0.391	0.953	36.413	16.037	0.448
10 Cincinnati	0.137	0.566	44.409	16.409	2.896
11 Ann Arbor	0.000	0.525	48.661	19.872	1.100
12 Chicago	0.539	0.840	50.064	23.398	0.798
13 Minneapolis	0.000	0.570	38.999	8.210	0.164
14 Lincoln	0.000	0.787	31.063	18.935	0.453
15 Kansas City	0.124	0.814	32.226	12.594	0.199
16 Jackson	0.072	0.597	26.818	33.527	0.331
17 Dallas	0.435	0.711	38.450	11.713	1.539
18 Phoenix	0.217	0.564	21.690	10.742	1.135
19 Denver	0.000	0.436	39.050	12.613	0.602
20 Portland	0.135	0.310	37.441	9.540	1.282
21 San Francisco	0.239	0.640	42.760	24.359	1.679
22 Long Beach	0.794	0.952	27.927	23.981	1.785

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Appendix D

SUPPLEMENTAL REGRESSION AND SIMULATION MODEL RESULTS

This appendix includes findings from both the regression and simulation analyses not presented in Chapter Three. These findings include the results of analyses using the fully specified model. In addition, we include the results of sensitivity analyses. We tested the sensitivity of the results to the population of veterans included in the analysis by estimating the patient- and facility-level equations with and without the Priority 7 patients (who are excluded from VERA workload calculations). Finally, to test the sensitivity of the results to alternative data and model specifications, we used alternative measures of each patient's annual treatment costs (ARC, HERC, and DSS) as the dependent variable in the patient-level regression equations. See Tables D.1–D.12 for each group of results.

Table D.1

Patient-Level Regression Results for the Policy Model (Excluding Basic Care Priority 7s) with All Case-Mix and Facility Indicator Variables Presented

		Base Case		VERA-3		VERA-10		VERA-47		VA DCGs	
	R-Squared	0.25		0.28		0.37		0.39		0.51	
Variable Category		Estimate	t-Statistic	Estimate	t-Statistic	Estimate	-Statistic	Estimate	t-Statistic	Estimate	t-Statistic
Intercept		-644.70	-10.28 **	-762.80	-2.77 **	71682.98	267.78 **	7170.78	28.08 **	169022.11	173.89 **
Age	Missing			-1306.46	-16.66 **	-362.48	-4.94 **	-370.60	-5.07 **	689.83	10.68 **
	Less than 25			-2740.90	-27.97 **	-1311.17	-14.31 **	-1248.32	-13.77 **	254.91	3.16 **
	25-34			-2572.93	-39.79 **	-1530.02	-25.28 **	-1473.05	-24.60 **	265.99	5.00 **
	35-44			-1711.95	-28.88 **	-1037.06	-18.68 **	-1006.31	-18.29 **	533.08	10.94 **
	45-54			-904.65	-16.03 **	-450.90	-8.53 **	-370.01	-7.07 **	798.10	17.21 **
	55-64			-94.17	-1.65	181.38	3.40 **	265.83	5.06 **	961.41	20.52 **
	65-74			-687.39	-12.49 **	-272.80	-5.31 **	-233.37	-4.61 **	477.91	10.56 **
	75-84			-394.13	-7.12 **	-117.40	-2.27 *	-76.42	-1.50	265.10	5.83 **
	85 and over			Reference		Reference		Reference		Reference	
Sex	Missing			-192.86	-0.49	-148.03	-0.40	-124.44	-0.34	-46.84	-0.14
	Female			323.01	9.32 **	213.27	6.59 **	297.88	9.34 **	306.76	10.77 **
	Male			Reference		Reference		Reference		Reference	
Physicians per Capita	Less than 0.001			-354.67	-11.28 **	-250.19	-8.53 **	-218.06	-7.55 **	-56.43	-2.18 *
	0.001 to 0.002			-334.64	-12.37 **	-244.62	-9.69 **	-218.09	-8.78 **	-71.59	-3.22 **
	0.0021 to 0.003			-151.76	-5.91 **	-115.36	-4.82 **	-95.18	-4.04 **	-23.03	-1.09
	Greater than 0.003			Reference		Reference		Reference		Reference	
Hospital Beds per Capita	Less than 0.003			-267.39	-9.63 **	-199.23	-7.69 **	-197.16	-7.73 **	-150.77	-6.60 **
	0.003 to 0.006			-115.50	-4.62 **	-72.15	-3.09 **	-77.55	-3.38 **	-32.63	-1.59
	Greater than 0.006			Reference		Reference		Reference		Reference	
ARF Variables Missing				-244.45	-0.89	194.74	0.76	172.72	0.69	78.10	0.35
Rural/Urban Status	Missing			1731.67	5.54 **	1120.27	3.84 **	1052.76	3.66 **	810.05	3.15 **
	Urban			185.75	4.36 **	175.22	4.41 **	183.22	4.69 **	41.14	1.18
	Suburban			114.08	2.75 **	79.68	2.06 *	86.76	2.28 *	18.39	0.54
	Rural			-102.69	-2.25 *	-101.59	-2.39 **	-98.63	-2.36 *	-84.74	-2.26 *
	Very Rural			Reference		Reference		Reference		Reference	
Distance to Closest Facility	Missing			-4555.30	-42.89 **	-3752.53	-37.83 **	-3688.91	-37.74 **	-2566.95	-29.38 **
	Less than 30 miles			-3099.72	-34.74 **	-2916.98	-35.02 **	-2828.58	-34.44 **	-2330.26	-31.77 **
	31 to 100 miles			-3111.76	-35.02 **	-2832.53	-34.15 **	-2759.68	-33.74 **	-2170.09	-29.71 **
	101 to 250 miles			-2524.72	-27.95 **	-2213.14	-26.24 **	-2161.92	-26.02 **	-1685.45	-22.70 **
	Greater than 250 miles			Reference		Reference		Reference		Reference	

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Table D.1—continued

		Base Case		VERA-3		VERA-10		VERA-47		VA DCGs	
	R-Squared	0.25		0.28		0.37		0.39		0.51	
Variable Category		Estimate	t-Statistic	Estimate	t-Statistic	Estimate	t-Statistic	Estimate	t-Statistic	Estimate	t-Statistic
Distance to Closest CBOC	Missing			1039.51	4.53 **	722.03	3.37 **	629.47	2.99 **	45.10	0.24
	Less than 30 miles			-248.45	-1.48	-205.92	-1.31	-247.85	-1.61	-200.75	-1.45
	31 to 100 miles			261.96	1.56	183.27	1.17	139.27	0.90	-48.47	-0.35
	Greater than 100 miles			Reference		Reference		Reference		Reference	
Medicare Reliance	Missing			3393.15	109.42 **	2542.15	87.78 **	2404.19	83.69 **	1451.37	56.95 **
	None			6238.67	190.74 **	4623.54	150.34 **	4533.86	149.28 **	2740.73	100.54 **
	1 to 24%			8692.82	245.63 **	6691.62	200.83 **	6563.72	199.42 **	3592.86	121.28 **
	25 to 49%			3621.76	85.78 **	2581.71	65.32 **	2568.04	65.94 **	908.95	26.04 **
	50 to 75%			1838.02	47.00 **	1011.46	27.63 **	1010.12	28.01 **	272.62	8.44 **
	75 to 100%			Reference		Reference		Reference		Reference	
Medicare Imputation Indicator				2677.46	73.14 **	2046.22	59.81 **	2007.07	59.60 **	1323.73	43.94 **
Medicaid Generosity LTC	Missing			-842.09	-2.46 *	-218.19	-0.68	-175.69	-0.56	-268.91	-0.96
	First Quartile (lowest)			824.76	11.21 **	726.90	10.58 **	669.17	9.90 **	443.23	7.33 **
	Second Quartile			578.74	9.03 **	492.73	8.24 **	456.86	7.77 **	308.77	5.86 **
	Third Quartile			654.10	11.88 **	591.81	11.52 **	552.85	10.94 **	332.11	7.34 **
	Fourth Quartile (highest)			Reference		Reference		Reference		Reference	
VERA 3 Patient Groups	Basic Care	3508.63	106.13 **	2576.10	77.89 **						
	Complex Care	36113.60	790.62 **	33754.88	731.08 **						
	Non-Vested	Reference		Reference							
VERA 10 Patient Groups	**Description**										
1	Non-Vested					-72343.05	-844.51 **				
2	Minor Medical					-71039.80	-861.36 **				
3	Mental Health					-69870.93	-821.39 **				
4	Heart and Lung					-69568.51	-837.13 **				
5	Oncology					-65281.58	-712.46 **				
6	Multiple Problem					-62235.17	-733.82 **				
7	Specialized Care					-52366.77	-521.43 **				
8	Supportive Care					-43357.88	-460.42 **				
9	Chronic Mental Illness					-31547.27	-295.81 **				
10	Critically Ill					Reference					

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Table D.1—continued

		Base Case		VERA-3		VERA-10		VERA-47		VA DCGs	
	R-Squared	0.25		0.28		0.37		0.39		0.51	
Variable Category		Estimate	t-Statistic	Estimate	t-Statistic	Estimate	t-Statistic	Estimate	t-Statistic	Estimate	t-Statistic
VERA 47 Patient Groups	Description										
10	Central Nervous System							-6252.60	-120.68 **		
11	Pulmonary Disease							-4284.65	-72.38 **		
12	Other Acute Disease							-6607.62	-139.06 **		
13	Ear, Nose and Throat							-6976.65	-125.72 **		
3a	Acute Mental Disease							-5558.28	-108.90 **		
3b	Addictive Disorder							-3448.87	-47.90 **		
4	Cardiovascular Disease							-5165.77	-106.01 **		
5	Oncology							-958.44	-13.87 **		
6	Musculoskeletal Disorder							-5700.26	-108.88 **		
7	Gastoenterology Disorder							-4516.12	-79.52 **		
9	Endo Nutr Metab Disorder							-6218.19	-121.45 **		
90	Employee/Collaterals							-7540.15	-30.22 **		
Aa	Substance Abuse							31078.27	124.27 **		
B1	Blind Rehab							21531.42	79.87 **		
Hb	Hepatitis C Basic							1.51	0.02		
Hc	Hepatitis C Complex							2314.07	10.66 **		
L1	Ventilator							152633.62	421.18 **		
L2	Rehabilitation							59827.74	366.09 **		
L3	Specialized Care							71687.47	249.27 **		
L4	Clinical Complex							56750.09	305.58 **		
L5	Behavioral							56376.97	134.87 **		
L6	Physical							58511.24	236.09 **		
L7	Low ADL							38520.61	271.73 **		
Lc	Community NH							25530.23	151.67 **		
Ld	Domicilliary							23830.93	140.62 **		
Lh	HBPC							14068.27	134.53 **		
Mh	Mental Health Intensive Case Management							28879.03	99.68 **		
Oa	Other Psychosis							28355.20	216.23 **		
Pa	PTSD							11472.95	88.88 **		
Pb	PTSD Acute							5385.87	41.18 **		
Ph	Pharmacy							-7429.46	-98.44 **		
Q1	SCI Quad-new Injury							58274.17	73.70 **		
Q2	SCI Quad-old Injury							22537.23	158.76 **		
Q3	SCI Para-new Injury							51141.98	49.98 **		
Q4	SCI Para-old Injury							16406.76	127.97 **		

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Table D.1—continued

		Base Case		VERA-3		VERA-10		VERA-47		VA DCGs	
	R-Squared	0.25		0.28		0.37		0.39		0.51	
Variable Category		Estimate	t-Statistic	Estimate	t-Statistic	Estimate	t-Statistic	Estimate	t-Statistic	Estimate	t-Statistic
Sa	Schizophrenia & Dementia							36247.98	363.98 **		
St	Stroke							16367.15	191.83 **		
Tb	Traumatic Brain Injury							14587.40	55.26 **		
XX	Transplants							67873.03	150.71 **		
Y	HIV without Retroviral Rx							-942.47	-4.98 **		
a1	HIV with Retroviral RX							10599.17	99.07 **		
cp	Comp and Pen Exam							-7642.76	-105.21 **		
d1	ESRD							59810.31	338.66 **		
dd	Psych+Substance							3533.71	39.94 **		
mm	Multiple Medical							3088.32	57.64 **		
uv	Non-Vested							-7758.13	-143.17 **		
mp	Medical/Psych+Substance							Reference			
VA DCG Patient Groups	Code										
	Missing									-169954.88	-178.53 **
	DCG 0.1									-169421.91	-179.18 **
	DCG 0.2									-168984.60	-178.68 **
	DCG 0.3									-168759.87	-178.35 **
	DCG 0.4									-168637.61	-178.11 **
	DCG 0.5									-168525.35	-178.15 **
	DCG 0.7									-168343.15	-178.00 **
	DCG 1									-167848.28	-177.48 **
	DCG 1.5									-167353.78	-176.93 **
	DCG 2									-167202.90	-176.74 **
	DCG 2.5									-166546.49	-176.09 **
	DCG 3									-165699.27	-175.19 **
	DCG 4									-164811.22	-174.22 **
	DCG 5									-163407.26	-172.76 **
	DCG 6									-160777.00	-169.97 **
	DCG 7.5									-155276.17	-164.14 **
	DCG 10									-141414.82	-149.48 **
	DCG 15									-124836.09	-131.83 **
	DCG 20									-116416.39	-122.70 **
	DCG 25									-105644.00	-110.96 **
	DCG 30									-89037.16	-93.34 **
	DCG 40									-64189.49	-66.31 **
	DCG 50									-33500.21	-33.21 **
	DCG 60									-14982.00	-13.53 **
	DCG 70									Reference	

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Table D.1—continued

		Base Case		VERA-3		VERA-10		VERA-47		VA DCGs	
	R-Squared	0.25		0.28		0.37		0.39		0.51	
Variable Category		Estimate	t-Statistic	Estimate	t-Statistic	Estimate	t-Statistic	Estimate	t-Statistic	Estimate	t-Statistic
VISN	(Code) Facility Location										
21	(358) VARO&OPC Manila, PI	-1951.73	-7.95 **	-1147.81	-4.02 **	-617.88	-2.32 *	-641.85	-2.44 *	-99.23	-0.42
1	(402) Togus, ME	377.76	3.43 **	1409.56	6.81 **	1558.44	8.06 **	1432.99	7.54 **	1407.87	8.27 **
1	(405) White River Junction, VT	628.74	4.89 **	1279.77	5.94 **	1481.15	7.36 **	1358.62	6.86 **	1107.58	6.25 **
19	(436) Fort Harrison, MT	-382.92	-3.20 **	-470.50	-2.22 *	-4.86	-0.02	-102.63	-0.53	-179.70	-1.03
13	(437) Fargo, ND	-92.30	-0.73	196.09	0.91	419.39	2.09 *	268.70	1.36	69.83	0.40
13	(438) Sioux Falls, SD	394.40	3.01 **	412.94	1.90	424.36	2.09 *	412.58	2.06 *	-717.24	-4.00 **
19	(442) Cheyenne, WY	640.27	3.80 **	1220.64	5.06 **	992.60	4.41 **	964.56	4.36 **	1164.00	5.87 **
15	(452) Wichita, KS	65.26	0.49	351.68	1.60	626.81	3.06 **	476.67	2.36 *	239.57	1.33
21	(459) Honolulu, VAMROC, HI	580.54	4.55 **	856.34	4.07 **	1425.27	7.26 **	1331.99	6.90 **	1577.94	9.13 **
4	(460) Wilmington, DE	120.19	0.94	924.73	4.28 **	952.13	4.72 **	905.74	4.56 **	587.97	3.31 **
20	(463) Anchorage, AK	2216.99	15.82 **	3082.96	13.39 **	3694.45	17.19 **	3518.58	16.64 **	3096.94	16.36 **
2	(500) VAMC Albany, NY	-1946.28	-14.14 **	-604.14	-2.71 **	-75.42	-0.36	-133.31	-0.65	246.49	1.34
18	(501) Albuquerque, NM	1106.38	11.76 **	811.20	4.01 **	1019.65	5.40 **	913.58	4.92 **	856.41	5.15 **
16	(502) Alexandria, LA	59.83	0.55	633.22	3.06 **	695.07	3.60 **	608.43	3.20 **	877.69	5.16 **
4	(503) Altoona, PA	-765.79	-5.81 **	910.36	4.14 **	1198.25	5.84 **	1081.79	5.36 **	1108.22	6.13 **
18	(504) Amarillo, TX	447.58	3.94 **	271.64	1.28	587.22	2.97 **	456.24	2.34 *	323.51	1.86
11	(506) Ann Arbor, MI	2945.56	26.01	3586.98	17.32 **	3096.48	16.02 **	2940.59	15.46 **	2734.17	16.06 **
7	(508) Atlanta, GA	599.69	6.78 **	1509.24	7.66 **	1744.90	9.49 **	1652.42	9.13 **	1040.75	6.42 **
7	(509) Augusta, GA	2260.68	20.28 **	2080.15	10.02 **	2081.92	10.74 **	2081.47	10.92 **	1447.12	8.48 **
5	(512) Baltimore/Loch Raven, MD	1574.84	17.84 **	2514.35	12.76 **	2510.93	13.65 **	2298.74	12.71 **	2108.44	13.02 **
2	(514) VAMC Bath, NY	-3276.20	-13.81 **	-1649.18	-5.61 **	-525.05	-1.91	-618.99	-2.29 *	106.97	0.44
11	(515) Battle Creek, MI	950.62	7.79 **	1579.62	7.41 **	1450.03	7.28 **	1307.26	6.67 **	2245.60	12.81 **
8	(516) Bay Pines, FL	483.77	5.57 **	1154.48	5.87 **	1315.90	7.17 **	1231.48	6.82 **	541.07	3.35 **
6	(517) Beckley, WV	424.02	2.74 **	582.57	2.49 *	712.74	3.26 **	709.65	3.30 **	-7.95	-0.04
1	(518) Bedford (Nourse) MA	2894.05	17.01 **	4380.31	17.98 **	2863.17	12.59 **	2799.26	12.51 **	3738.88	18.67 **
18	(519) Big Spring, TX	-159.43	-1.16	75.26	0.33	473.27	2.25 *	296.37	1.43	521.60	2.82 **
16	(520) Biloxi, MS	101.39	1.13	495.99	2.51 *	798.07	4.33 **	761.05	4.20 **	664.61	4.09 **
7	(521) Birmingham, AL	729.21	7.71 **	1333.35	6.68 **	1724.51	9.26 **	1580.62	8.63 **	1257.38	7.67 **
1	(523) Boston (Jamaica Plain), MA	3175.45	36.73 **	4267.10	21.74 **	3913.92	21.36 **	3732.05	20.70 **	3052.47	18.92 **
3	(526) Bronx, NY	2338.69	20.86 **	3559.47	17.04 **	3303.03	16.94 **	3116.69	16.25 **	3313.33	19.30 **
3	(527) Brooklyn, NY	1924.16	16.55 **	3232.95	15.30 **	2735.26	13.87 **	2565.78	13.22 **	2393.94	13.78 **
2	(528) Buffalo, NY	2345.54	28.34 **	2828.36	14.49 **	2582.14	14.17 **	2415.83	13.48 **	2140.25	13.34 **
4	(529) Butler, PA	-176.15	-1.27	1536.86	6.86 **	1489.74	7.13 **	1371.54	6.67 **	1583.05	8.60 **
20	(531) Boise, ID	797.03	6.00 **	994.20	4.54 **	1089.24	5.33 **	975.41	4.85 **	-547.21	-3.04 **
2	(532) VAMC Canandaigua, NY	3787.40	16.16 **	4984.69	17.13 **	4610.85	16.97 **	4506.54	16.85 **	5181.82	21.66 **
7	(534) Charleston, SC	340.58	3.44 **	582.71	2.87 **	961.46	5.07 **	909.45	4.87 **	1105.54	6.62 **
12	(537) VA Chicago-Westside, IL	1504.95	16.89 **	2066.52	10.49 **	2072.28	11.27 **	1939.62	10.72 **	1639.25	10.12 **
10	(538) Chillicothe, OH	2152.96	15.77 **	3292.14	14.79 **	3083.59	14.84 **	2760.52	13.50 **	2681.56	14.66 **

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Table D.1—continued

		Base Case		VERA-3		VERA-10		VERA-47		VA DCGs	
R-Squared		0.25		0.28		0.37		0.39		0.51	
Variable Category		Estimate	t-Statistic	Estimate	t-Statistic	Estimate	t-Statistic	Estimate	t-Statistic	Estimate	t-Statistic
VISN	(Code) Facility Location										
10	(539) Cincinnati, OH	2855.14	24.81 **	3868.07	18.54 **	3479.96	17.87 **	3300.28	17.22 **	1697.77	9.90 **
4	(540) Clarksburg, WV	697.94	5.46 **	1000.90	4.61 **	1242.03	6.12 **	1138.03	5.70 **	760.11	4.26 **
10	(541) Cleveland-Wade Park, OH	131.63	1.62	1711.13	8.80 **	1686.31	9.29 **	1503.87	8.42 **	1229.79	7.69 **
4	(542) Coatesville, PA	1396.74	9.18 **	3223.64	13.92 **	2217.62	10.26 **	1920.01	9.02 **	3238.74	17.01 **
15	(543) Columbia, MO	1034.26	8.91 **	1197.56	5.70 **	1353.15	6.89 **	1229.43	6.37 **	390.12	2.26 *
7	(544) Columbia, SC	-87.89	-0.96	290.59	1.45	698.98	3.73 **	601.53	3.26 **	751.76	4.55 **
8	(546) Miami, FL	1847.81	19.74 **	2287.96	10.93 **	2204.22	11.28 **	2135.12	11.11 **	2338.35	13.59 **
8	(548) West Palm Beach, FL	145.33	1.50	1240.79	6.17 **	1078.33	5.74 **	965.95	5.23 **	840.49	5.08 **
17	(549) Dallas, TX	611.38	7.94 **	1347.47	6.89 **	1492.06	8.18 **	1445.70	8.05 **	887.32	5.52 **
11	(550) Danville, IL	115.95	1.02	337.09	1.61	192.72	0.99	178.30	0.93	-8.32	-0.05
10	(552) Dayton, OH	1456.43	13.24 **	2770.90	13.37 **	2401.51	12.41 **	2208.05	11.60 **	2139.33	12.55 **
11	(553) Detroit, MI	1420.20	14.23 **	2258.34	11.18 **	2053.55	10.89 **	1901.52	10.25 **	2078.93	12.52 **
19	(554) Denver, CO	1422.95	13.60 **	2926.34	14.27 **	2891.75	15.11 **	2762.07	14.67 **	689.36	4.09 **
14	(555) Des Moines, IA	-1345.48	-8.53 **	-1014.83	-4.32 **	-458.33	-2.09 *	-511.24	-2.37 *	-677.48	-3.51 **
12	(556) North Chicago, IL	1716.55	12.53 **	2693.71	12.16 **	2367.66	11.44 **	2295.14	11.27 **	2547.13	13.98 **
7	(557) Dublin, GA	-412.47	-3.27 **	370.21	1.71	270.78	1.34	225.08	1.13	182.25	1.03
6	(558) Durham, NC	1865.10	17.82 **	2289.55	11.21 **	1989.79	10.44 **	1740.57	9.28 **	1540.79	9.18 **
3	(561) East Orange, NJ	1800.43	20.39 **	2661.47	13.56 **	2818.13	15.39 **	2720.69	15.10 **	2784.03	17.26 **
4	(562) Erie, PA	84.36	0.61	1246.85	5.55 **	1482.49	7.08 **	1329.25	6.45 **	1329.85	7.21 **
16	(564) Fayetteville, AR	-408.33	-3.49 **	-150.97	-0.72	376.13	1.93	260.68	1.36	417.11	2.43 *
6	(565) Fayetteville, NC	-701.77	-6.64 **	60.21	0.29	330.27	1.72	220.53	1.17	544.27	3.22 **
19	(567) Fort Lyon, CO	829.32	5.42 **	2127.63	9.13 **	2183.28	10.04 **	2043.94	9.55 **	2472.92	12.92 **
13	(568) Black Hills-Fort Meade, SD	1228.39	9.10 **	1332.86	6.03 **	1138.40	5.52 **	1039.59	5.12 **	208.52	1.15
21	(570) Fresno, CA	738.06	6.26 **	1322.41	6.25 **	1388.16	7.03 **	1279.16	6.58 **	1099.96	6.32 **
8	(573) Gainesville, FL	210.56	2.77 **	996.31	5.18 **	896.27	5.00 **	817.20	4.63 **	382.09	2.42 *
19	(575) Grand Junction, CO	581.25	3.36 **	1078.92	4.37 **	1144.46	4.97 **	935.24	4.13 **	623.74	3.08 **
12	(578) Hines, IL	2454.93	24.77 **	2814.60	13.98 **	2656.30	14.14 **	2508.75	13.57 **	1976.76	11.95 **
16	(580) Houston, TX	1289.98	15.89 **	1420.91	7.22 **	1635.67	8.90 **	1515.67	8.38 **	1525.85	9.43 **
9	(581) Huntington, WV	86.99	0.79	438.64	2.14 *	817.35	4.27 **	676.34	3.59 **	526.98	3.13 **
11	(583) Indianapolis, IN	1474.90	14.97 **	1651.55	8.22 **	1749.22	9.33 **	1595.55	8.65 **	522.29	3.16 **
14	(584) Iowa City, IA	993.50	8.79 **	1176.08	5.65 **	1539.44	7.92 **	1392.59	7.28 **	380.71	2.22 *
12	(585) Iron Mountain, MI	-304.63	-1.97 *	10.06	0.04	195.19	0.90	94.27	0.44	312.11	1.63
16	(586) Jackson, MS	816.37	8.35 **	819.37	4.02 **	790.09	4.15 **	718.41	3.84 **	385.58	2.30 *
15	(589) Kansas City, MO	1188.10	11.13 **	1708.40	8.37 **	1675.61	8.80 **	1532.51	8.18 **	287.51	1.71
6	(590) Hampton, VA	559.84	4.95 **	960.42	4.55 **	1031.25	5.23 **	894.31	4.61 **	564.16	3.25 **
22	(593) Las Vegas, NV	-135.64	-1.33	791.72	3.83 **	1041.79	5.39 **	967.25	5.09 **	1067.35	6.27 **
4	(595) Lebanon, PA	371.82	3.33 **	1951.43	9.34 **	1818.79	9.33 **	1600.12	8.34 **	1654.84	9.64 **
9	(596) Lexington, Leestown, KY	1666.59	15.52 **	1721.84	8.38 **	1608.08	8.39 **	1567.04	8.31 **	1096.72	6.50 **
14	(597) Lincoln, NE	-1369.63	-7.87 **	-965.38	-3.92 **	-276.69	-1.20	-341.70	-1.51	250.86	1.24
16	(598) Little Rock, AR	2013.05	22.89 **	2041.25	10.38 **	2142.43	11.67 **	1996.97	11.06 **	1617.80	10.01 **

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Table D.1—continued

		Base Case		VERA-3		VERA-10		VERA-47		VA DCGs	
	R-Squared	0.25		0.28		0.37		0.39		0.51	
Variable Category		Estimate	t-Statistic	Estimate	t-Statistic	Estimate	t-Statistic	Estimate	t-Statistic	Estimate	t-Statistic
VISN	(Code) Facility Location										
22	(600) Long Beach, CA	2179.84	22.59 **	3121.39	15.50 **	2874.33	15.29 **	2817.25	15.23 **	2221.38	13.42 **
9	(603) Louisville, KY	613.92	6.03 **	1235.83	6.10 **	1438.31	7.61 **	1314.00	7.07 **	1224.81	7.36 **
22	(605) Loma Linda, CA	855.41	9.05 **	1815.68	9.04 **	1634.58	8.72 **	1539.65	8.35 **	1370.34	8.30 **
12	(607) Madison, WI	1999.59	16.03 **	2800.76	13.09 **	2374.06	11.89 **	2253.09	11.47 **	-93.59	-0.53
1	(608) Manchester, NH	193.88	1.40	1650.43	7.37 **	1202.49	5.75 **	1061.62	5.16 **	1357.82	7.38 **
15	(609) Marion, IL	-730.99	-7.14 **	-161.94	-0.80	334.09	1.76	212.80	1.14	-344.95	-2.07 *
11	(610) NIHCS-Marion, IN	1399.92	10.95 **	2280.71	10.52 **	2247.26	11.11 **	2051.45	10.31 **	2378.20	13.35 **
21	(612) NCHCS/Martinez, CA	-388.90	-4.49 **	423.43	2.15 *	480.29	2.61 **	356.74	1.97 *	97.55	0.60
5	(613) Martinsburg, WV	988.94	8.59 **	1579.04	7.56 **	1594.61	8.18 **	1456.92	7.60 **	995.74	5.80 **
9	(614) Memphis, TN	1298.55	13.48 **	1487.12	7.49 **	1686.59	9.10 **	1619.49	8.88 **	964.66	5.91 **
13	(618) Minneapolis, MN	1986.26	22.60 **	2608.03	13.24 **	2575.29	14.01 **	2426.49	13.41 **	872.02	5.39 **
7	(619) CAVHCS- Montgomery, AL	1063.40	10.51 **	2001.99	9.85 **	2109.14	11.11 **	2060.93	11.04 **	2220.06	13.29 **
3	(620) Montrose, NY	2084.24	17.73 **	3992.14	18.81 **	4097.61	20.68 **	3919.57	20.10 **	3795.53	21.76 **
9	(621) Mountain Home, TN	888.24	8.01 **	1206.39	5.86 **	1072.90	5.58 **	868.70	4.59 **	-67.16	-0.40
9	(622) Murfreesboro, TN	355.24	3.21 **	843.46	4.09 **	679.22	3.53 **	535.53	2.83 **	536.48	3.16 **
16	(623) Muskogee, OK	-143.64	-1.31	112.92	0.54	724.58	3.70 **	625.92	3.25 **	641.96	3.72 **
9	(626) Nashville, TN	1095.97	11.48 **	1622.67	8.14 **	1629.52	8.76 **	1510.78	8.25 **	875.51	5.34 **
16	(629) New Orleans, LA	1561.71	15.99 **	1904.00	9.47 **	1999.51	10.66 **	1927.97	10.44 **	1862.91	11.27 **
3	(630) New York, NY	3272.00	31.92 **	4333.06	21.31 **	4279.89	22.55 **	4117.10	22.05 **	3491.00	20.89 **
1	(631) Northampton, MA	196.23	1.25	1448.12	6.17 **	1678.93	7.66 **	1538.51	7.14 **	1244.73	6.45 **
3	(632) Northport, NY	2394.31	22.46 **	3752.56	18.18 **	3478.53	18.06 **	3367.75	17.77 **	2978.21	17.56 **
16	(635) Oklahoma City, OK	307.24	3.44 **	515.93	2.58 **	827.87	4.43 **	709.98	3.86 **	431.59	2.62 **
14	(636) Omaha, NE	2704.31	24.71 **	2601.19	12.61 **	2466.73	12.81 **	2197.54	11.60 **	941.75	5.55 **
6	(637) Asheville, NC	1457.98	11.94 **	1336.63	6.26 **	1456.52	7.30 **	1276.81	6.51 **	1065.26	6.07 **
21	(640) Palo Alto, CA	3496.90	37.04 **	4272.64	21.37 **	3973.30	21.28 **	3927.08	21.38 **	3852.91	23.44 **
4	(642) Philadelphia, PA	845.47	9.06 **	2231.10	11.28 **	2122.63	11.49 **	2025.83	11.15 **	2161.99	13.30 **
18	(644) Phoenix, AZ	766.53	8.49 **	1380.43	6.86 **	1544.00	8.21 **	1436.73	7.77 **	666.79	4.03 **
4	(646) Pittsburgh-University Drive, PA	2469.00	26.94 **	3681.33	18.57 **	2940.56	15.89 **	2760.19	15.16 **	2538.10	15.58 **
15	(647) VAMC Poplar Bluff, MO	-580.60	-4.11 **	-121.40	-0.54	254.66	1.22	205.01	1.00	229.64	1.25
20	(648) Portland, OR	2262.44	23.88 **	2840.20	14.28 **	2561.16	13.79 **	2521.03	13.80 **	1335.86	8.17 **
18	(649) Prescott, AZ	-93.60	-0.62	-277.40	-1.19	-323.71	-1.49	-526.59	-2.46 *	43.21	0.23
1	(650) Providence, RI	278.42	2.40 *	1511.87	7.18 **	1469.47	7.47 **	1329.29	6.87 **	698.35	4.03 **
6	(652) Richmond, VA	2250.84	22.00 **	2136.40	10.38 **	2092.92	10.89 **	2026.59	10.72 **	1204.64	7.12 **
20	(653) Roseburg, OR	457.12	3.57 **	842.98	3.87 **	892.67	4.39 **	810.50	4.05 **	951.78	5.32 **
21	(654) Reno, NV	310.50	2.59 **	404.06	1.89	628.64	3.15 **	504.99	2.57 *	293.32	1.67
11	(655) Saginaw, MI	67.93	0.52	637.23	2.93 **	749.53	3.69 **	625.23	3.13 **	1017.66	5.68 **
13	(656) St. Cloud, MN	225.08	1.47	1042.18	4.48 **	312.54	1.44	-29.86	-0.14	485.88	2.54 *
15	(657) St Louis, John Cochrane, MO	1169.41	12.41 **	1837.06	9.23 **	1665.24	8.96 **	1521.54	8.32 **	1109.14	6.78 **
6	(658) Salem, VA	1090.72	10.05 **	1203.64	5.76 **	946.48	4.86 **	863.98	4.51 **	718.37	4.18 **
6	(659) Salisbury, NC	109.19	1.08	1127.55	5.57 **	1437.01	7.60 **	1194.61	6.42 **	1679.09	10.08 **

Table D.1—continued

		Base Case		VERA-3		VERA-10		VERA-47		VA DCGs	
	R-Squared	0.25		0.28		0.37		0.39		0.51	
Variable Category		Estimate	t-Statistic	Estimate	t-Statistic	Estimate	t-Statistic	Estimate	t-Statistic	Estimate	t-Statistic
VISN	(Code) Facility Location										
19	(660) Salt Lake City, UT	1685.66	16.05 **	1850.99	9.08 **	1997.11	10.50 **	1840.92	9.84 **	751.65	4.49 **
21	(662) San Francisco, CA	3062.03	28.93 **	3565.71	17.38 **	3499.12	18.27 **	3449.79	18.31 **	3035.43	18.00 **
20	(663) Seattle, WA	1007.39	12.33 **	1896.12	9.76 **	2000.04	11.03 **	1886.38	10.57 **	1286.72	8.06 **
22	(664) San Diego, CA	1562.06	17.14 **	2794.21	14.04 **	3033.75	16.33 **	2958.80	16.19 **	2736.10	16.73 **
19	(666) Sheridan, WY	1380.55	6.70 **	1328.60	4.93 **	1326.73	5.27 **	1198.25	4.84 **	816.08	3.68 **
16	(667) Shreveport, LA	517.50	5.16 **	962.43	4.77 **	1219.10	6.47 **	1141.12	6.16 **	692.81	4.18 **
20	(668) Spokane, WA	13.40	0.11	513.38	2.39 *	642.85	3.20 **	548.31	2.78 **	265.84	1.50
2	(670) VAMC Syracuse, NY	-3057.84	-16.06 **	-1356.57	-5.25 **	-311.23	-1.29	-449.69	-1.90	-116.27	-0.55
17	(671) San Antonio, TX	932.85	11.48 **	1281.42	6.50 **	1256.69	6.83 **	1195.20	6.60 **	1061.61	6.55 **
8	(673) Tampa, FL	183.27	2.42 *	1044.38	5.43 **	1074.30	5.99 **	1025.34	5.81 **	483.84	3.06 **
17	(674) Temple, TX	729.66	8.62 **	1010.69	5.10 **	1157.42	6.25 **	1012.49	5.56 **	924.03	5.67 **
12	(676) Tomah, WI	1398.41	8.36 **	2685.51	11.11 **	2629.59	11.65 **	2377.83	10.71 **	2707.84	13.63 **
15	(677) VAMC Topeka, KS	1213.06	10.90 **	1682.50	8.14 **	1627.74	8.43 **	1416.11	7.45 **	371.62	2.19 *
18	(678) Tucson, AZ	536.42	5.36 **	619.19	3.02 **	761.38	3.97 **	629.17	3.34 **	-298.90	-1.77
7	(679) Tuscaloosa, AL	1320.44	8.58 **	1738.66	7.47 **	1227.79	5.65 **	1161.57	5.43 **	1297.21	6.78 **
20	(687) Walla Walla, WA	-337.08	-2.16 *	54.19	0.23	320.53	1.47	128.42	0.60	914.27	4.77 **
5	(688) Washington, DC	1451.31	15.33 **	2305.36	11.65 **	2446.87	13.24 **	2415.55	13.29 **	2255.49	13.86 **
1	(689) VACHS, West Haven, CT	1583.86	16.73 **	2767.03	13.83 **	2570.11	13.76 **	2476.16	13.47 **	2502.43	15.21 **
22	(691) West Los Angeles, CA	2287.25	29.35 **	3299.75	17.08 **	3011.45	16.70 **	2944.42	16.59 **	2763.17	17.40 **
20	(692) White City, OR	-3213.22	-16.90 **	-2262.88	-8.77 **	-1869.91	-7.76 **	-2125.27	-8.94 **	-2363.91	-11.14 **
4	(693) Wilkes-Barre, PA	606.19	6.05 **	1951.07	9.61 **	1934.25	10.20 **	1811.44	9.71 **	1668.85	10.00 **
12	(695) Milwaukee, WI	1651.13	16.37 **	2666.03	13.15 **	2503.79	13.23 **	2340.82	12.57 **	1812.21	10.87 **
18	(756) El Paso, TX	-675.41	-5.64 **	-306.51	-1.42	428.43	2.13 *	281.99	1.42	686.85	3.87 **
10	(757) Columbus IOC, OH	-925.35	-7.55 **	605.16	2.82 **	1093.98	5.47 **	974.45	4.95 **	770.04	4.37 **
8	(672) San Juan, PR	Reference		Reference		Reference		Reference		Reference	

* Indicates statistical significance at 95% confidence level.

** Indicates statistical significance at 99% confidence level.

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NOTE: The data on physicians per capita and hospital beds per capita from the ARF data were missing for the same group of individuals. As a result, only one missing category can be estimated between the two variables. That estimate is reported in the row labeled ARF Variables Missing.

Table D.2

Patient-Level Regression Results for the Fully Specified Model (Excluding Basic Care Priority 7s)

	R-Squared	Base Case 0.25		VERA-3 0.29		VERA-10 0.38		VERA-47 0.40		VA DCGs 0.51	
Variable Category		**Estimate**	**t-Statistic**	**Estimate**	**t-Statistic**	**Estimate**	**t-Statistic**	**Estimate**	**t-Statistic**	**Estimate**	**t-Statistic**
Intercept		-644.70	-10.28 **	-1498.64	-5.30 **	68174.27	247.07 **	5134.49	19.48 **	167213.50	172.09 **
Age	Missing			-766.67	-9.77 **	-227.42	-3.09 **	-148.93	-2.05 *	708.19	10.88 **
	Less than 25			-1657.72	-17.04 **	-670.01	-7.34 **	-597.99	-6.63 **	524.36	6.50 **
	25-34			-1964.27	-30.61 **	-1102.23	-18.29 **	-1012.05	-16.98 **	384.54	7.22 **
	35-44			-1501.38	-25.53 **	-851.11	-15.39 **	-771.16	-14.09 **	551.81	11.32 **
	45-54			-904.75	-16.16 **	-385.48	-7.32 **	-261.44	-5.02 **	770.06	16.60 **
	55-64			51.88	0.92	342.32	6.46 **	448.61	8.58 **	1031.33	22.04 **
	65-74			-155.08	-2.84 **	140.11	2.74 **	181.89	3.61 **	688.87	15.24 **
	75-84			26.34	0.48	208.73	4.06 **	243.20	4.81 **	427.59	9.42 **
	85 and over			Reference		Reference		Reference		Reference	
Income	Missing			713.67	10.33 **	784.84	12.12 **	712.08	11.17 **	127.26	2.22 *
	$20,000 or less			-11.59	-0.17	70.53	1.11	29.16	0.47	-365.66	-6.51 **
	$21,000 - $40,000			24.43	0.36	68.89	1.08	49.85	0.79	-306.10	-5.42 **
	$41,000 - $60,000			-264.04	-3.50 **	-61.16	-0.86	-32.78	-0.47	-60.24	-0.96
	$61,000 - $80,000			-673.36	-7.19 **	-157.26	-1.79	-82.03	-0.95	-112.10	-1.44
	More than $80,000			Reference		Reference		Reference		Reference	
Race	Missing			-2195.23	-122.99 **	-1671.84	-99.43 **	-1653.49	-99.46 **	-722.35	-48.18 **
	Hispanic			-692.25	-14.48 **	-472.74	-10.55 **	-463.26	-10.51 **	-265.82	-6.71 **
	American Indian			-546.18	-3.84 **	-534.03	-4.01 **	-550.12	-4.20 **	-410.78	-3.49 **
	Black			-199.80	-8.09 **	-117.57	-5.08 **	-133.45	-5.84 **	-66.51	-3.25 **
	Asian			-783.14	-6.64 **	-662.34	-5.99 **	-618.28	-5.69 **	-92.41	-0.94
	White			Reference		Reference		Reference		Reference	
Sex	Missing			-97.89	-0.25	-103.18	-0.28	-90.56	-0.25	-32.16	-0.10
	Female			148.47	4.32 **	84.65	2.63 **	174.44	5.49 **	249.09	8.74 **
	Male			Reference		Reference		Reference		Reference	
Marital Status	Missing			-1325.13	-36.36 **	-551.27	-15.42 **	-554.08	-14.43 **	-357.08	-11.52 **
	Single			545.97	33.82 **	411.95	27.16 **	357.14	23.89 **	122.94	9.18 **
	Married			Reference		Reference		Reference		Reference	

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Table D.2—continued

		Base Case		VERA-3		VERA-10		VERA-47		VA DCGs	
	R-Squared	0.25		0.29		0.38		0.40		0.51	
Variable Category		Estimate	t-Statistic	Estimate	t-Statistic	Estimate	t-Statistic	Estimate	t-Statistic	Estimate	t-Statistic
Number of MDs per Capita	Less than 0.001			-291.63	-9.35 **	-214.34	-7.33 **	-193.03	-6.71 **	-45.56	-1.76
	0.001 to 0.002			-223.61	-8.33 **	-177.52	-7.05 **	-164.38	-6.64 **	-55.13	-2.48 *
	0.0021 to 0.003			-113.62	-4.47 **	-94.99	-3.98 **	-81.56	-3.48 **	-24.02	-1.14
	Greater than 0.003			Reference		Reference		Reference		Reference	
Hospital Beds per Capita	Less than 0.003			-192.16	-6.98 **	-145.04	-5.62 **	-147.56	-5.81 **	-134.77	-5.90 **
	0.003 to 0.006			-66.50	-2.68 **	-34.86	-1.50	-40.96	-1.79	-14.31	-0.70
	Greater than 0.006			Reference		Reference		Reference		Reference	
ARF Variables Missing				-138.63	-0.51	169.09	0.67	148.93	0.60	48.18	0.21
Rural/Urban Status	Missing			1533.65	4.94 **	1075.14	3.70 **	1009.30	3.53 **	825.22	3.21 **
	Urban			222.12	5.27 **	205.48	5.20 **	207.98	5.35 **	41.86	1.20
	Suburban			111.40	2.72 **	79.87	2.08 *	83.07	2.20 *	12.88	0.38
	Rural			-97.17	-2.16 *	-100.34	-2.38 *	-100.14	-2.41 *	-87.31	-2.34 *
	Very Rural			Reference		Reference		Reference		Reference	
Distance to Closest Facility	Missing			-4213.61	-40.11 **	-3602.42	-36.56 **	-3569.55	-36.78 **	-2516.46	-28.87 **
	Less than 30 miles			-2928.23	-33.17 **	-2787.67	-33.68 **	-2731.56	-33.48 **	-2259.23	-30.87 **
	31 to 100 miles			-2858.99	-32.53 **	-2648.66	-32.14 **	-2614.06	-32.19 **	-2081.12	-28.56 **
	101 to 250 miles			-2288.53	-25.61 **	-2045.79	-24.42 **	-2028.12	-24.58 **	-1602.13	-21.63 **
	Greater than 250 miles			Reference		Reference		Reference		Reference	
Distance to Closest CBOC	Missing			926.91	4.09 **	670.26	3.15 **	573.91	2.74 **	39.10	0.21
	Less than 30 miles			-287.64	-1.73	-234.43	-1.50	-279.45	-1.82	-224.74	-1.63
	31 to 100 miles			142.21	0.86	99.57	0.64	52.12	0.34	-91.12	-0.66
	Greater than 100 miles			Reference		Reference		Reference		Reference	

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Table D.2—continued

		Base Case		VERA-3		VERA-10		VERA-47		VA DCGs	
	R-Squared	0.25		0.29		0.38		0.40		0.51	
Variable Category		Estimate	t-Statistic	Estimate	t-Statistic	Estimate	t-Statistic	Estimate	t-Statistic	Estimate	t-Statistic
Priority Group	Missing			133.82	0.15	-352.55	-0.41	-127.37	-0.15	126.05	0.17
	Priority 1			2472.09	67.69 **	1925.27	56.03 **	2021.29	59.56 **	1109.74	36.53 **
	Priority 2			1069.91	27.38 **	806.70	22.01 **	842.85	23.35 **	522.99	16.14 **
	Priority 3			816.00	22.75 **	635.38	18.89 **	652.34	19.69 **	420.74	14.14 **
	Priority 4			7606.89	163.60 **	5698.42	129.98 **	5922.37	136.50 **	3386.85	87.44 **
	Priority 5			785.79	23.93 **	582.43	18.91 **	574.41	18.93 **	218.61	8.02 **
	Priority 6			20.65	0.30	-36.72	-0.56	-16.52	-0.26	-9.95	-0.17
	Priority 7			Reference		Reference		Reference		Reference	
Medicare Reliance	Missing			3829.91	124.09 **	2941.97	101.54 **	2792.99	97.40 **	1735.23	67.76 **
	None			5713.27	175.00 **	4385.17	142.61 **	4293.39	141.49 **	2742.33	100.35 **
	1 to 24%			8182.84	232.55 **	6489.34	195.49 **	6352.65	193.88 **	3617.22	122.17 **
	25 to 49%			3320.69	79.39 **	2480.64	63.15 **	2456.81	63.51 **	934.47	26.82 **
	50 to 75%			1601.19	41.34 **	946.06	26.01 **	929.82	25.96 **	293.66	9.11 **
	75 to 100%			Reference		Reference		Reference		Reference	
Medicare Imputation Indicator				2701.59	74.53 **	2129.00	62.59 **	2086.38	62.34 **	1414.07	47.00 **
Medicaid Generosity General	Missing			-488.59	-1.44	-83.23	-0.26	-44.96	-0.14	-282.73	-1.00
	First Quartile (lowest)			-230.96	-2.44 *	-263.40	-2.97 **	-271.88	-3.12 **	-263.85	-3.37 **
	Second Quartile			145.14	2.00 *	101.37	1.49	92.02	1.38	-19.93	-0.33
	Third Quartile			331.13	6.83 **	310.22	6.82 **	298.28	6.67 **	232.49	5.78 **
	Fourth Quartile (highest)			Reference		Reference		Reference		Reference	
Medicaid Generosity Long-term Care	First Quartile (lowest)			964.19	10.80 **	872.41	10.43 **	812.75	9.88 **	588.81	7.96 **
	Second Quartile			565.63	7.66 **	487.19	7.04 **	450.49	6.62 **	310.01	5.06 **
	Third Quartile			635.39	11.16 **	576.62	10.80 **	541.81	10.32 **	336.40	7.13 **
	Fourth Quartile (highest)			Reference		Reference		Reference		Reference	

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Table D.2—continued

	R-Squared	Base Case 0.25		VERA-3 0.29		VERA-10 0.38		VERA-47 0.40		VA DCGs 0.51	
Variable Category		**Estimate**	**t-Statistic**	**Estimate**	**t-Statistic**	**Estimate**	**t-Statistic**	**Estimate**	**t-Statistic**	**Estimate**	**t-Statistic**
VERA 3 Patient Groups	Basic Care	3508.63	106.13 **	1746.52	52.65 **						
	Complex Care	36113.60	790.62 **	30678.94	648.45 **						
	Non-Vested	Reference		Reference							
VERA 10 Patient Groups	**Description**										
1	Non-Vested					-69651.06	-803.28 **				
2	Minor Medical					-68822.98	-831.90 **				
3	Mental Health					-68172.86	-801.35 **				
4	Heart and Lung					-67345.95	-807.62 **				
5	Oncology					-63461.16	-692.78 **				
6	Multiple Problem					-60692.40	-716.13 **				
7	Specialized Care					-51381.27	-513.86 **				
8	Supportive Care					-43214.77	-461.92 **				
9	Chronic Mental Illness					-31465.22	-296.76 **				
10	Critically Ill					Reference					
VERA 47 Patient Groups	**Description**										
10	Central Nervous System							-5623.90	-109.01 **		
11	Pulmonary Disease							-3646.51	-61.88 **		
12	Other Acute Disease							-5816.00	-122.67 **		
13	Ear, Nose and Throat							-6017.73	-108.71 **		
3a	Acute Mental Disease							-5289.91	-104.36 **		
3b	Addictive Disorder							-3257.21	-45.37 **		
4	CardiovascularDisease							-4294.80	-88.26 **		
5	Oncology							-382.83	-5.57 **		
6	Musculoskeletal Disorder							-4907.25	-94.05 **		
7	Gastoenterology Disorder							-3801.34	-67.22 **		
9	Endo Nutr Metab Disorder							-5361.96	-104.94 **		
90	Employee/Collaterals							-6683.19	-26.93 **		

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Table D.2—continued

		Base Case		VERA-3		VERA-10		VERA-47		VA DCGs	
	R-Squared	0.25		0.29		0.38		0.40		0.51	
Variable Category		Estimate	t-Statistic	Estimate	t-Statistic	Estimate	t-Statistic	Estimate	t-Statistic	Estimate	t-Statistic
Aa	Substance Abuse							30272.47	121.85 **		
B1	Blind Rehab							19038.69	70.96 **		
Hb	Hepatitis C Basic							130.70	1.58		
Hc	Hepatitis C Complex							2799.11	12.99 **		
L1	Ventilator							151587.20	421.32 **		
L2	Rehabilitation							57892.87	355.87 **		
L3	Specialized Care							68901.19	240.92 **		
L4	Clinical Complex							55136.94	298.62 **		
L5	Behavioral							55159.47	132.90 **		
L6	Physical							57124.24	232.03 **		
L7	Low ADL							37683.43	267.52 **		
Lc	Community NH							24717.39	147.84 **		
Ld	Domicilliary							23362.88	138.69 **		
Lh	HBPC							13095.85	125.93 **		
Mh	Mental Health Intensive Case Management							27334.79	95.00 **		
Oa	Other Psychosis							26945.31	206.61 **		
Pa	PTSD							10953.12	85.36 **		
Pb	PTSD Acute							4781.63	36.82 **		
Ph	Pharmacy							-6545.47	-77.92 **		
Q1	SCI Quad-new Injury							56012.36	71.35 **		
Q2	SCI Quad-old Injury							20374.77	143.50 **		
Q3	SCI Para-new Injury							49032.82	48.27 **		
Q4	SCI Para-old Injury							14511.94	113.32 **		
Sa	Schizophrenia & Dementia							34789.54	350.50 **		
St	Stroke							15122.83	177.64 **		
Tb	Traumatic Brain Injury							13887.88	52.99 **		
XX	Transplants							67778.93	151.60 **		
Y	HIV without Retroviral Rx							-811.57	-4.31 **		
a1	HIV with Retroviral RX							10735.08	100.86 **		
cp	Comp and Pen Exam							-6136.88	-81.61 **		
d1	ESRD							59096.37	336.83 **		

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Table D.2—continued

		Base Case		VERA-3		VERA-10		VERA-47		VA DCGs	
	R-Squared	0.25		0.29		0.38		0.40		0.51	
Variable Category		Estimate	t-Statistic	Estimate	t-Statistic	Estimate	t-Statistic	Estimate	t-Statistic	Estimate	t-Statistic
dd	Psych+Substance							2770.57	31.46 **		
mm	Multiple Medical							3402.18	63.87 **		
uv	Non-Vested							-6455.24	-118.33 **		
mp	Medical/Psych+Substance							Reference			
VA DCG Patient Groups	Code										
	Missing									-168303.22	-177.19 **
	DCG 0.1									-167733.09	-177.85 **
	DCG 0.2									-167355.34	-177.42 **
	DCG 0.3									-167163.57	-177.13 **
	DCG 0.4									-167028.33	-176.88 **
	DCG 0.5									-166940.91	-176.94 **
	DCG 0.7									-166816.87	-176.85 **
	DCG 1									-166359.90	-176.37 **
	DCG 1.5									-165903.08	-175.86 **
	DCG 2									-165780.83	-175.70 **
	DCG 2.5									-165164.98	-175.09 **
	DCG 3									-164365.30	-174.24 **
	DCG 4									-163527.07	-173.32 **
	DCG 5									-162190.85	-171.93 **
	DCG 6									-159639.29	-169.22 **
	DCG 7.5									-154283.34	-163.53 **
	DCG 10									-140684.56	-149.11 **
	DCG 15									-124347.76	-131.67 **
	DCG 20									-116022.52	-122.62 **
	DCG 25									-105319.34	-110.92 **
	DCG 30									-88825.31	-93.38 **
	DCG 40									-63966.34	-66.26 **
	DCG 50									-33425.76	-33.23 **
	DCG 60									-14938.11	-13.53 **
	DCG 70									Reference	

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Table D.2—continued

		Base Case		VERA-3		VERA-10		VERA-47		VA DCGs	
	R-Squared	0.25		0.29		0.38		0.40		0.51	
Variable Category		Estimate	t-Statistic	Estimate	t-Statistic	Estimate	t-Statistic	Estimate	t-Statistic	Estimate	t-Statistic
VISN	(Code) Facility Location										
21	(358) VARO&OPC Manila, PI	-1951.73	-7.95 **	-2077.62	-6.94 **	-1469.03	-5.24 **	-1499.94	-5.41 **	-920.20	-3.71 **
1	(402) Togus, ME	377.76	3.43 **	1424.40	6.80 **	1558.73	7.94 **	1434.55	7.43 **	1293.83	7.45 **
1	(405) White River Junction, VT	628.74	4.89 **	1503.85	6.90 **	1622.87	7.94 **	1528.62	7.61 **	1017.34	5.63 **
19	(436) Fort Harrison, MT	-382.92	-3.20 **	310.06	1.43	558.54	2.75 **	469.67	2.35 *	43.62	0.24
13	(437) Fargo, ND	-92.30	-0.73	424.90	1.95	517.40	2.53 *	382.57	1.90	25.75	0.14
13	(438) Sioux Falls, SD	394.40	3.01 **	1038.06	4.68 **	858.48	4.13 **	866.28	4.24 **	-591.82	-3.22 **
19	(442) Cheyenne, WY	640.27	3.80 **	813.26	3.35 **	682.37	3.00 **	678.57	3.03 **	917.26	4.56 **
15	(452) Wichita,KS	65.26	0.49	265.92	1.20	555.57	2.67 **	436.44	2.13 *	191.31	1.04
21	(459) Honolulu,VAMROC, HI	580.54	4.55 **	1418.95	6.53 **	1843.79	9.06 **	1745.56	8.72 **	1585.18	8.80 **
4	(460) Wilmington, DE	120.19	0.94	608.90	2.78 **	631.53	3.08 **	603.84	2.99 **	302.27	1.67
20	(463) Anchorage, AK	2216.99	15.82 **	3970.28	16.94 **	4234.84	19.28 **	4050.47	18.75 **	3135.10	16.14 **
2	(500) VAMC Albany, NY	-1946.28	-14.14 **	-384.87	-1.71	35.62	0.17	8.43	0.04	187.67	1.00
18	(501) Albuquerque, NM	1106.38	11.76 **	1230.08	6.00 **	1369.95	7.13 **	1291.57	6.84 **	1006.54	5.92 **
16	(502) Alexandria, LA	59.83	0.55	764.88	3.63 **	787.02	3.99 **	732.41	3.77 **	897.60	5.14 **
4	(503) Altoona, PA	-765.79	-5.81 **	1504.43	6.71 **	1562.39	7.43 **	1475.36	7.13 **	1087.31	5.85 **
18	(504) Amarillo, TX	447.58	3.94 **	699.48	3.24 **	939.44	4.64 **	836.56	4.20 **	500.41	2.80 **
11	(506) Ann Arbor, MI	2945.56	26.01	3846.51	18.32 **	3268.51	16.60 **	3142.94	16.23 **	2664.80	15.31 **
7	(508) Atlanta, GA	599.69	6.78 **	1479.14	7.36 **	1717.47	9.11 **	1649.71	8.90 **	1021.17	6.13 **
7	(509) Augusta, GA	2260.68	20.28 **	1823.60	8.65 **	1905.59	9.65 **	1951.15	10.04 **	1296.77	7.42 **
5	(512) Baltimore/Loch Raven, MO	1574.84	17.84 **	2456.86	12.12 **	2386.86	12.55 **	2219.00	11.87 **	1903.53	11.32 **
2	(514) VAMC Bath, NY	-3276.20	-13.81 **	-1918.00	-6.53 **	-780.53	-2.83 **	-832.92	-3.07 **	-104.58	-0.43
11	(515) Battle Creek, MI	950.62	7.79 **	971.86	4.47 **	971.79	4.77 **	895.07	4.47 **	1839.77	10.22 **
8	(516) Bay Pines, FL	483.77	5.57 **	1141.15	5.69 **	1324.45	7.04 **	1263.30	6.83 **	524.21	3.15 **
6	(517) Beckley, WV	424.02	2.74 **	161.67	0.68	339.21	1.52	370.78	1.69	-328.45	-1.66
1	(518) Bedford (Nourse), MA	2894.05	17.01 **	4003.12	16.34 **	2666.43	11.61 **	2659.51	11.77 **	3497.53	17.22 **
18	(519) Big Spring, TX	-159.43	-1.16	30.86	0.14	448.02	2.09 *	320.09	1.52	517.63	2.73 **
16	(520) Biloxi, MS	101.39	1.13	557.76	2.79 **	834.40	4.45 **	814.08	4.42 **	621.01	3.75 **
7	(521) Birmingham, AL	729.21	7.71 **	1869.42	9.04 **	2189.03	11.29 **	2079.00	10.90 **	1504.24	8.77 **
1	(523) Boston (Jamaica Plain), MA	3175.45	36.73 **	4252.15	21.35 **	3939.61	21.10 **	3787.08	20.63 **	2961.02	17.93 **

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Table D.2—continued

		Base Case		VERA-3		VERA-10		VERA-47		VA DCGs	
	R-Squared	0.25		0.29		0.38		0.40		0.51	
Variable Category		Estimate	t-Statistic	Estimate	t-Statistic	Estimate	t-Statistic	Estimate	t-Statistic	Estimate	t-Statistic
VISN	(Code) Facility Location										
3	(526) Bronx, NY	2338.69	20.86 **	3879.23	18.47 **	3544.77	18.00 **	3401.59	17.57 **	3370.63	19.36 **
3	(527) Brooklyn, NY	1924.16	16.55 **	3813.60	17.87 **	3179.87	15.89 **	3037.79	15.44 **	2536.38	14.34 **
2	(528) Buffalo, NY	2345.54	28.34 **	3027.81	15.29 **	2750.88	14.82 **	2613.42	14.32 **	2138.09	13.03 **
4	(529) Butler, PA	-176.15	-1.27	1653.73	7.26 **	1532.81	7.17 **	1451.51	6.91 **	1422.84	7.53 **
20	(531) Boise, ID	797.03	6.00 **	1239.89	5.56 **	1312.23	6.28 **	1222.77	5.95 **	-455.19	-2.46 *
2	(532) VAMC Canandaigua, NY	3787.40	16.16 **	4543.39	15.61 **	4314.61	15.80 **	4273.50	15.91 **	4898.32	20.29 **
7	(534) Charleston, SC	340.58	3.44 **	319.24	1.55	709.24	3.66 **	691.82	3.63 **	898.11	5.25 **
12	(537) VA Chicago-Westside, IL	1504.95	16.89 **	1747.05	8.67 **	1752.55	9.28 **	1665.07	8.96 **	1348.39	8.07 **
10	(538) Chillicothe, OH	2152.96	15.77 **	2905.48	12.94 **	2850.92	13.54 **	2584.97	12.49 **	2510.47	13.49 **
10	(539) Cincinnati, OH	2855.14	24.81 **	3934.29	18.65 **	3557.30	17.99 **	3401.52	17.49 **	1694.50	9.69 **
4	(540) Clarksburg, WV	697.94	5.46 **	762.41	3.44 **	1007.78	4.85 **	941.00	4.60 **	516.87	2.81 **
10	(541) Cleveland-Wade Park, OH	131.63	1.62	1752.40	8.88 **	1731.14	9.36 **	1597.79	8.78 **	1178.72	7.20 **
4	(542) Coatesville, PA	1396.74	9.18 **	3434.23	14.62 **	2408.04	10.93 **	2182.58	10.07 **	3074.38	15.79 **
15	(543) Columbia, MO	1034.26	8.91 **	964.68	4.50 **	1166.64	5.80 **	1055.67	5.34 **	241.80	1.36
7	(544) Columbia, SC	-87.89	-0.96	296.98	1.45	619.78	3.23 **	539.26	2.86 **	581.44	3.43 **
8	(546) Miami, FL	1847.81	19.74 **	2620.79	12.35 **	2426.04	12.19 **	2360.90	12.06 **	2391.16	13.59 **
8	(548) West Palm Beach, FL	145.33	1.50	1084.48	5.29 **	974.16	5.07 **	887.94	4.70 **	762.14	4.49 **
17	(549) Dallas, TX	611.38	7.94 **	1563.86	7.80 **	1659.12	8.83 **	1642.74	8.89 **	944.37	5.68 **
11	(550) Danville, IL	115.95	1.02	-298.92	-1.40	-344.40	-1.73	-300.32	-1.53	-394.66	-2.24 *
10	(552) Dayton, OH	1456.43	13.24 **	2842.18	13.56 **	2460.74	12.52 **	2293.41	11.86 **	2076.09	11.94 **
11	(553) Detroit, MI	1420.20	14.23 **	2080.52	10.08 **	1842.11	9.52 **	1745.14	9.17 **	1809.99	10.58 **
19	(554) Denver, CO	1422.95	13.60 **	2556.56	12.22 **	2488.31	12.69 **	2378.68	12.33 **	362.67	2.09 *
14	(555) Des Moines, IA	-1345.48	-8.53 **	-1096.97	-4.58 **	-511.50	-2.28 *	-537.54	-2.44 *	-775.41	-3.91 **
12	(556) North Chicago, IL	1716.55	12.53 **	2511.50	11.17 **	2149.54	10.20 **	2094.00	10.10 **	2212.59	11.87 **
7	(557) Dublin, GA	-412.47	-3.27 **	645.76	2.94 **	471.20	2.29 *	452.46	2.24 *	235.87	1.30
6	(558) Durham, NC	1865.10	17.82 **	2196.17	10.48 **	1855.35	9.45 **	1614.87	8.36 **	1286.74	7.41 **
3	(561) East Orange, NJ	1800.43	20.39 **	2886.99	14.34 **	2965.59	15.71 **	2881.89	15.53 **	2736.17	16.39 **
4	(562) Erie, PA	84.36	0.61	1079.60	4.75 **	1298.07	6.09 **	1174.84	5.60 **	1100.03	5.83 **
16	(564) Fayetteville, AR	-408.33	-3.49 **	-179.02	-0.84	311.59	1.56	232.09	1.18	256.42	1.45

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Table D.2—continued

	R-Squared	Base Case 0.25		VERA-3 0.29		VERA-10 0.38		VERA-47 0.40		VA DCGs 0.51	
Variable Category		Estimate	t-Statistic	Estimate	t-Statistic	Estimate	t-Statistic	Estimate	t-Statistic	Estimate	t-Statistic
VISN	(Code) Facility Location										
6	(565) Fayetteville, NC	-701.77	-6.64 **	344.02	1.63	476.68	2.41 *	379.67	1.95	374.04	2.14 *
19	(567) Fort Lyon, CO	829.32	5.42 **	1985.49	8.43 **	2012.74	9.11 **	1905.22	8.77 **	2154.14	11.03 **
13	(568) Black Hills-Fort Meade, SD	1228.39	9.10 **	1446.08	6.46 **	1254.74	5.98 **	1174.17	5.69 **	194.82	1.05
21	(570) Fresno, CA	738.06	6.26 **	2025.51	9.29 **	2011.11	9.84 **	1943.77	9.67 **	1466.94	8.12 **
8	(573) Gainesville, FL	210.56	2.77 **	992.62	5.06 **	917.18	4.98 **	863.90	4.77 **	365.87	2.25 *
19	(575) Grand Junction, CO	581.25	3.36 **	702.31	2.82 **	824.11	3.53 **	663.95	2.89 **	339.47	1.64
12	(578) Hines, IL	2454.93	24.77 **	2559.24	12.44 **	2429.64	12.60 **	2339.30	12.34 **	1701.78	9.98 **
16	(580) Houston, TX	1289.98	15.89 **	1526.94	7.58 **	1753.23	9.28 **	1671.43	9.00 **	1583.32	9.48 **
9	(581) Huntington, WV	86.99	0.79	-34.82	-0.17	383.06	1.95 *	269.06	1.39	178.78	1.03
11	(583) Indianapolis, IN	1474.90	14.97 **	1132.12	5.52 **	1280.98	6.66 **	1154.06	6.10 **	182.74	1.07
14	(584) Iowa City, IA	993.50	8.79 **	1419.69	6.72 **	1694.72	8.55 **	1575.17	8.08 **	395.54	2.26 *
12	(585) Iron Mountain, MI	-304.63	-1.97 *	-48.01	-0.21	91.47	0.42	23.39	0.11	126.02	0.65
16	(586) Jackson, MS	816.37	8.35 **	370.63	1.79	413.64	2.13 *	373.73	1.96	141.15	0.82
15	(589) Kansas City, MO	1188.10	11.13 **	2162.04	10.42 **	2043.84	10.50 **	1913.72	10.00 **	407.10	2.37 *
6	(590) Hampton, VA	559.84	4.95 **	711.65	3.32 **	822.38	4.09 **	720.05	3.65 **	340.15	1.92
22	(593) Las Vegas, NV	-135.64	-1.33	1208.40	5.72 **	1391.42	7.02 **	1357.67	6.97 **	1205.33	6.88 **
4	(595) Lebanon, PA	371.82	3.33 **	1857.88	8.69 **	1697.60	8.47 **	1514.09	7.68 **	1404.38	7.93 **
9	(596) Lexington, Leestown, KY	1666.59	15.52 **	1538.47	7.35 **	1428.55	7.28 **	1414.95	7.33 **	837.23	4.82 **
14	(597) Lincoln, NE	-1369.63	-7.87 **	-520.25	-2.09 *	-21.63	-0.09	-61.84	-0.27	148.53	0.72
16	(598) Little Rock, AR	2013.05	22.89 **	1693.74	8.37 **	1815.04	9.57 **	1690.69	9.07 **	1268.21	7.56 **
22	(600) Long Beach, CA	2179.84	22.59 **	3506.39	16.85 **	3275.33	16.79 **	3277.32	17.08 **	2493.21	14.45 **
9	(603) Louisville, KY	613.92	6.03 **	855.26	4.14 **	1040.96	5.37 **	929.18	4.88 **	843.99	4.92 **
22	(605) Loma Linda, CA	855.41	9.05 **	2045.51	9.85 **	1898.37	9.75 **	1849.20	9.66 **	1569.00	9.12 **
12	(607) Madison, WI	1999.59	16.03 **	2659.71	12.31 **	2279.61	11.26 **	2167.61	10.89 **	-175.84	-0.98
1	(608) Manchester, NH	193.88	1.40	1147.60	5.08 **	840.74	3.97 **	721.18	3.46 **	1068.95	5.71 **
15	(609) Marion, IL	-730.99	-7.14 **	-181.27	-0.88	261.31	1.35	174.19	0.91	-527.08	-3.07 **
11	(610) NIHCS-Marion, IN	1399.92	10.95 **	1806.53	8.21 **	1840.67	8.92 **	1693.62	8.34 **	2021.58	11.08 **
21	(612) NCHCS/Martinez, CA	-388.90	-4.49 **	405.99	1.99 *	529.85	2.77 **	441.19	2.34 *	213.91	1.26
5	(613) Martinsburg, WV	988.94	8.59 **	1283.86	6.05 **	1320.58	6.64 **	1213.93	6.20 **	746.67	4.24 **

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Table D.2—continued

	R-Squared	Base Case 0.25		VERA-3 0.29		VERA-10 0.38		VERA-47 0.40		VA DCGs 0.51	
Variable Category		Estimate	t-Statistic	Estimate	t-Statistic	Estimate	t-Statistic	Estimate	t-Statistic	Estimate	t-Statistic
VISN	(Code) Facility Location										
9	(614) Memphis, TN	1298.55	13.48 **	1210.14	6.01 **	1447.50	7.66 **	1426.11	7.68 **	806.99	4.83 **
13	(618) Minneapolis, MN	1986.26	22.60 **	3248.57	16.26 **	3047.89	16.27 **	2906.22	15.77 **	1009.23	6.09 **
7	(619) CAVHCS-Montgomery, AL	1063.40	10.51 **	2327.71	11.18 **	2400.50	12.30 **	2383.69	12.42 **	2372.10	13.74 **
3	(620) Montrose, NY	2084.24	17.73 **	3955.42	18.44 **	4090.48	20.34 **	3980.76	20.12 **	3689.96	20.75 **
9	(621) Mountain Home, TN	888.24	8.01 **	1287.50	6.15 **	1148.79	5.85 **	953.24	4.94 **	-88.84	-0.51
9	(622) Murfreesboro, TN	355.24	3.21 **	695.64	3.30 **	608.87	3.08 **	500.41	2.57 **	473.09	2.71 **
16	(623) Muskogee, OK	-143.64	-1.31	412.55	1.92 *	978.36	4.87 **	911.62	4.61 **	688.27	3.87 **
9	(626) Nashville, TN	1095.97	11.48 **	1362.59	6.71 **	1369.25	7.19 **	1243.89	6.64 **	709.03	4.21 **
16	(629) New Orleans, LA	1561.71	15.99 **	1921.66	9.39 **	1939.22	10.10 **	1903.84	10.09 **	1831.71	10.79 **
3	(630) New York, NY	3272.00	31.92 **	4788.33	23.31 **	4618.15	23.99 **	4483.05	23.68 **	3597.51	21.13 **
1	(631) Northampton, MA	196.23	1.25	1464.73	6.20 **	1723.98	7.78 **	1623.12	7.45 **	1163.81	5.94 **
3	(632) Northport, NY	2394.31	22.46 **	4013.06	19.21 **	3682.48	18.80 **	3589.46	18.63 **	2955.19	17.06 **
16	(635) Oklahoma City, OK	307.24	3.44 **	334.87	1.63	703.97	3.66 **	603.75	3.19 **	343.34	2.02 *
14	(636) Omaha, NE	2704.31	24.71 **	2575.45	12.30 **	2384.79	12.15 **	2127.63	11.02 **	782.75	4.51 **
6	(637) Asheville, NC	1457.98	11.94 **	913.45	4.19 **	1078.77	5.28 **	927.51	4.61 **	722.02	3.99 **
21	(640) Palo Alto, CA	3496.90	37.04 **	4657.65	22.50 **	4398.70	22.67 **	4415.66	23.14 **	4081.28	23.78 **
4	(642) Philadelphia, PA	845.47	9.06 **	2239.20	11.13 **	2073.05	11.00 **	1997.94	10.78 **	1970.51	11.82 **
18	(644) Phoenix, AZ	766.53	8.49 **	1599.52	7.77 **	1751.32	9.08 **	1683.95	8.88 **	775.59	4.55 **
4	(646) Pittsburgh-University Dr., PA	2469.00	26.94 **	3442.28	16.98 **	2742.47	14.43 **	2600.52	13.92 **	2270.49	13.51 **
15	(647) VAMC Poplar Bluff, MO	-580.60	-4.11 **	-150.14	-0.66	211.44	0.99	193.05	0.92	116.17	0.61
20	(648) Portland, OR	2262.44	23.88 **	3220.43	15.56 **	2951.33	15.21 **	2929.80	15.35 **	1586.42	9.25 **
18	(649) Prescott, AZ	-93.60	-0.62	285.03	1.21	165.90	0.75	-1.43	-0.01	255.47	1.30
1	(650) Providence, RI	278.42	2.40 *	2203.47	10.35 **	2018.12	10.11 **	1893.28	9.64 **	858.05	4.86 **
6	(652) Richmond, VA	2250.84	22.00 **	2009.67	9.62 **	1956.46	9.99 **	1919.04	9.96 **	1052.67	6.08 **
20	(653) Roseburg, OR	457.12	3.57 **	1032.35	4.60 **	1144.88	5.44 **	1116.10	5.40 **	1123.10	6.04 **
21	(654) Reno, NV	310.50	2.59 **	1247.25	5.71 **	1322.98	6.46 **	1250.25	6.21 **	634.70	3.50 **
11	(655) Saginaw, MI	67.93	0.52	1459.36	6.59 **	1298.34	6.25 **	1206.27	5.91 **	1092.79	5.95 **
13	(656) St. Cloud, MN	225.08	1.47	1423.39	6.07 **	672.00	3.06 **	377.44	1.75	559.91	2.88 **
15	(657) St. Louis, John Cochran, MO	1169.41	12.41 **	1883.35	9.29 **	1693.32	8.91 **	1583.67	8.47 **	1016.53	6.05 **

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Table D.2—continued

		Base Case		VERA-3		VERA-10		VERA-47		VA DCGs	
	R-Squared	0.25		0.29		0.38		0.40		0.51	
Variable Category		Estimate	t-Statistic	Estimate	t-Statistic	Estimate	t-Statistic	Estimate	t-Statistic	Estimate	t-Statistic
VISN	(Code) Facility Location										
6	(658) Salem, VA	1090.72	10.05 **	1085.19	5.12 **	836.00	4.21 **	788.98	4.04 **	559.27	3.18 **
6	(659) Salisbury, NC	109.19	1.08	1245.93	5.99 **	1393.57	7.14 **	1174.45	6.12 **	1430.40	8.29 **
19	(660) Salt Lake City, UT	1685.66	16.05 **	1882.18	9.00 **	2088.76	10.65 **	1960.88	10.17 **	884.15	5.10 **
21	(662) San Francisco, CA	3062.03	28.93 **	3986.84	18.80 **	3902.17	19.63 **	3879.23	19.84 **	3276.84	18.64 **
20	(663) Seattle, WA	1007.39	12.33 **	1969.98	9.56 **	2121.46	10.98 **	2028.29	10.68 **	1335.35	7.82 **
22	(664) San Diego, CA	1562.06	17.14 **	3484.13	16.91 **	3550.07	18.37 **	3486.89	18.35 **	3007.35	17.60 **
19	(666) Sheridan, WY	1380.55	6.70 **	1069.44	3.93 **	1141.54	4.47 **	1067.03	4.25 **	730.74	3.24 **
16	(667) Shreveport, LA	517.50	5.16 **	861.71	4.23 **	1132.39	5.93 **	1090.09	5.81 **	661.38	3.92 **
20	(668) Spokane, WA	13.40	0.11	1272.30	5.73 **	1280.89	6.16 **	1206.82	5.90 **	558.94	3.04 **
2	(670) VAMC Syracuse, NY	-3057.84	-16.06 **	-213.88	-0.82	402.17	1.65	288.71	1.21	119.06	0.55
17	(671) San Antonio, TX	932.85	11.48 **	1423.39	7.12 **	1378.02	7.36 **	1329.88	7.22 **	1106.79	6.68 **
8	(673) Tampa, FL	183.27	2.42 *	1082.59	5.52 **	1137.38	6.19 **	1114.65	6.17 **	488.50	3.01 **
17	(674) Temple, TX	729.66	8.62 **	1245.32	6.13 **	1349.92	7.09 **	1206.73	6.45 **	952.72	5.66 **
12	(676) Tomah, WI	1398.41	8.36 **	3346.10	13.76 **	3130.54	13.73 **	2911.12	12.98 **	2791.73	13.85 **
15	(677) VAMC Topeka, KS	1213.06	10.90 **	1781.25	8.51 **	1725.76	8.79 **	1554.00	8.05 **	398.25	2.29 *
18	(678) Tucson, AZ	536.42	5.36 **	270.61	1.29	535.01	2.73 **	450.88	2.34 *	-407.07	-2.35 *
7	(679) Tuscaloosa, AL	1320.44	8.58 **	1884.39	7.94 **	1427.34	6.41 **	1434.64	6.55 **	1450.27	7.37 **
20	(687) Walla Walla, WA	-337.08	-2.16 *	146.34	0.61	458.71	2.04 *	323.02	1.46	1001.41	5.03 **
5	(688) Washington, DC	1451.31	15.33 **	2527.70	12.53 **	2502.12	13.23 **	2466.02	13.26 **	2123.19	12.69 **
1	(689) VACHS, West Haven, CT	1583.86	16.73 **	3012.63	14.86 **	2773.74	14.59 **	2711.54	14.50 **	2478.95	14.75 **
22	(691) West Los Angeles, CA	2287.25	29.35 **	3973.89	19.80 **	3645.93	19.38 **	3633.90	19.64 **	3136.80	18.85 **
20	(692) White City, OR	-3213.22	-16.90 **	-2147.26	-8.17 **	-1656.52	-6.72 **	-1945.11	-8.00 **	-2241.52	-10.28 **
4	(693) Wilkes-Barre, PA	606.19	6.05 **	1925.36	9.28 **	1869.62	9.61 **	1781.38	9.31 **	1468.07	8.53 **
12	(695) Milwaukee, WI	1651.13	16.37 **	2672.75	13.02 **	2529.41	13.15 **	2390.61	12.63 **	1733.08	10.18 **
18	(756) El Paso, TX	-675.41	-5.64 **	608.07	2.77	1103.36	5.37 **	953.55	4.72 **	880.49	4.84 **
10	(757) Columbus IOC, OH	-925.35	-7.55 **	1588.38	7.33 **	1810.14	8.91 **	1716.60	8.59 **	1004.26	5.59 **
8	(672) San Juan, PR	Reference		Reference		Reference		Reference		Reference	

* Indicates statistical significance at 95% confidence level.

** Indicates statistical significance at 99% confidence level.

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NOTE: The data on physicians per capita and hospital beds per capita from the ARF data were missing for the same group of individuals. As a result, only one missing category can be estimated between the two variables. That estimate is reported in the row labeled *ARF Variables Missing.

Table D.3

Facility-Level Regression Results for the Fully Specified Model (Excluding Basic Care Priority 7s)

	Base Case		VERA-3		VERA-10		VERA-47		VA DCGs	
R-Squared	**0.35**		**0.60**		**0.59**		**0.61**		**0.58**	
Variable	**Estimate**	**t-Statistic**	**Estimate**	**t-Statistic**	**Estimate**	**t-Statistic**	**Estimate**	**t-Statistic**	**Estimate**	**t-Statistic**
Intercept	-2597.02	-1.16	-9161.28	-3.57 **	-7896.32	-3.58 **	-7873.58	-3.66 **	-7784.84	-3.63 **
Rural/Urban Status										
Urban			-291.57	-0.41	-398.79	-0.64	-411.84	-0.68	-824.35	-1.37
Suburban			-746.16	-1.02	-720.29	-1.15	-718.68	-1.17	-1214.81	-1.99 *
Rural			-843.53	-1.03	-660.77	-0.94	-679.23	-0.99	-1107.47	-1.62
Very Rural			Reference		Reference		Reference			
Residents per Full-time MD	500.63	2.43 *	-148.38	-0.56	-143.03	-0.63	-162.85	-0.73	-671.91	-3.02 **
VA Labor Index	2729.02	1.22	8334.34	3.38 **	8031.05	3.78 **	7994.02	3.85 **	8171.14	3.96 **
Average Food Cost per Bed Day			13.96	0.53	9.09	0.40	8.69	0.39	9.22	0.42
Energy Price (dollars per million BTUs)			8.87	0.13	-8.27	-0.15	-8.03	-0.14	42.42	0.77
Contract Labor Costs			-3015.75	-0.91	-2566.58	-0.90	-2262.94	-0.81	-3542.67	-1.28
Square Feet of Building Space per Acre of Land			6.58	1.88	7.20	2.39 *	6.98	2.37 *	7.96	2.72 **
Square Feet of Building Space per Unique Patient			-13.61	-1.98 *	-15.99	-2.70 **	-16.07	-2.78 **	-15.17	-2.64 **
Research Costs per 1000 Unique Patients	0.006	5.17 **	0.005	2.55 *	0.004	2.14 *	0.004	2.30 *	0.004	2.15 *
Percent of Funded Research			-5421.51	-0.33	394.60	0.03	-541.47	-0.04	8060.63	0.59
Average Building Age as of 2001			-4.32	-0.55	-2.47	-0.36	-2.88	-0.43	-0.81	-0.12
Average Building Condition (scale of 1-5)			30.85	0.19	29.66	0.22	21.74	0.16	-18.39	-0.14
Leased Square Feet per Patient			115.11	1.70	125.64	2.15 *	122.50	2.15 *	113.63	2.01 *
Ratio of Historic to Total Number of Buildings			142.15	0.32	175.84	0.46	179.67	0.48	356.89	0.96
Total Number of Buildings			4.79	1.11	5.16	1.38	4.85	1.33	0.81	0.22

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Table D.3—continued

	Base Case		VERA-3		VERA-10		VERA-47		VA DCGs	
R-Squared	0.35		0.60		0.59		0.61		0.58	
Variable	Estimate	t-Statistic	Estimate	t-Statistic	Estimate	t-Statistic	Estimate	t-Statistic	Estimate	t-Statistic
Indicator for Recent Facility/Management Consolidation			-281.85	-1.01	-165.83	-0.69	-147.06	-0.63	-131.81	-0.56
Occupancy Rate			332.39	0.57	-15.48	-0.03	-43.06	-0.09	-247.07	-0.51
Number of CBOCs per 1000 Unique Patients			1460.61	2.47 *	924.04	1.82	873.99	1.76	451.67	0.92
Direct Patient Care FTEs per 1000 Unique Patients			79.41	1.35	75.81	1.50	73.40	1.49	-13.83	-0.28
Non-patient Care FTEs per 1000 Unique Patients			50.77	2.66 **	39.73	2.42 *	41.27	2.57 *	67.76	4.24 **
LTC Beds per 1000 Unique Patients			-20.76	-1.74	-16.91	-1.65	-19.31	-1.93	-23.54	-2.37 *
Special Program Beds per 1000 Unique Patients			-81.59	-0.59	-0.43	0.00	12.28	0.10	-12.64	-0.11

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* Indicates statistical significance at 95% confidence level.

** Indicates statistical significance at 99% confidence level.

Table D.4

Comparison of FY 2002 Actual Allocations with Simulated Allocations (in $1,000) for the Fully Specified Model (Excluding Basic Care Priority 7s)

VISN	FY02 Allocations	VERA -3	Diff from FY02	VERA-10	Diff from FY02	VERA-47	Diff from FY02	VA DCGs	Diff from FY02
01 Boston	909,715	898,871	-1.2%	905,776	-0.4%	912,070	0.3%	929,351	2.2%
02 Albany	497,198	536,698	7.9%	519,492	4.5%	520,054	4.6%	509,589	2.5%
03 Bronx	1,037,301	926,017	-10.7%	934,703	-9.9%	937,153	-9.7%	946,464	-8.8%
04 Pittsburgh	936,020	797,009	-14.9%	842,337	-10.0%	845,556	-9.7%	813,878	-13.0%
05 Baltimore	564,929	593,851	5.1%	584,382	3.4%	584,972	3.5%	569,367	0.8%
06 Durham	861,286	883,243	2.5%	892,869	3.7%	899,291	4.4%	892,687	3.6%
07 Atlanta	1,050,304	1,053,749	0.3%	1,034,914	-1.5%	1,027,181	-2.2%	1,026,073	-2.3%
08 Bay Pines	1,437,387	1,510,210	5.1%	1,525,367	6.1%	1,513,145	5.3%	1,500,467	4.4%
09 Nashville	831,591	924,390	11.2%	909,100	9.3%	910,391	9.5%	895,172	7.6%
10 Cincinnati	682,951	588,538	-13.8%	610,776	-10.6%	616,990	-9.7%	636,490	-6.8%
11 Ann Arbor	750,330	813,982	8.5%	821,763	9.5%	822,229	9.6%	796,735	6.2%
12 Chicago	883,268	923,169	4.5%	938,619	6.3%	938,788	6.3%	927,745	5.0%
13 Minneapolis	508,738	461,262	-9.3%	477,896	-6.1%	480,148	-5.6%	542,876	6.7%
14 Lincoln	348,050	305,580	-12.2%	302,972	-13.0%	306,010	-12.1%	328,260	-5.7%
15 Kansas City	703,102	690,353	-1.8%	681,407	-3.1%	684,298	-2.7%	711,459	1.2%
16 Jackson	1,466,801	1,633,994	11.4%	1,579,045	7.7%	1,573,738	7.3%	1,506,972	2.7%
17 Dallas	832,097	846,952	1.8%	852,552	2.5%	849,746	2.1%	827,043	-0.6%
18 Phoenix	715,290	701,380	-1.9%	690,179	-3.5%	691,793	-3.3%	696,491	-2.6%
19 Denver	473,985	446,885	-5.7%	444,197	-6.3%	445,249	-6.1%	470,867	-0.7%
20 Portland	824,844	769,656	-6.7%	769,971	-6.7%	770,521	-6.6%	829,729	0.6%
21 San Francisco	931,506	997,863	7.1%	971,886	4.3%	968,721	4.0%	961,621	3.2%
22 Long Beach	1,062,308	1,005,348	-5.4%	1,018,797	-4.1%	1,010,958	-4.8%	989,665	-6.8%
23 Lincoln & Minneapolis	856,788	766,843	-10.5%	780,868	-8.9%	786,158	-8.2%	871,136	1.7%

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Table D.5

Patient-Level Regression Results for the Policy Model (Including Basic Care Priority 7s)

		Base Case		VERA-3		VERA-10		VERA-47		VA DCGs	
	R-Squared	0.25		0.28		0.38		0.39		0.51	
Variable Category		Estimate	t-Statistic	Estimate	t-Statistic	Estimate	t-Statistic	Estimate	t-Statistic	Estimate	t-Statistic
Intercept		-644.70	-10.28 **	-562.27	-2.58 **	72041.58	335.35 **	7351.76	36.21 **	169147.00	192.81 **
Age	Missing			-1036.83	-16.19 **	-218.74	-3.65 **	-230.61	-3.87 **	483.11	9.14 **
	Less than 25			-1796.58	-27.38 **	-882.92	-14.40 **	-834.66	-13.79 **	23.84	0.44
	25-34			-1914.83	-36.43 **	-1083.59	-22.04 **	-1049.09	-21.59 **	145.50	3.35 **
	35-44			-1262.90	-25.72 **	-714.65	-15.55 **	-704.39	-15.49 **	413.58	10.21 **
	45-54			-593.05	-12.60 **	-235.89	-5.36 **	-185.96	-4.27 **	685.60	17.66 **
	55-64			25.87	0.54	242.92	5.48 **	302.67	6.92 **	861.12	22.00 **
	65-74			-737.25	-16.01 **	-347.50	-8.09 **	-310.47	-7.33 **	398.85	10.50 **
	75-84			-393.48	-8.48 **	-153.53	-3.54 **	-115.74	-2.71 **	219.95	5.75 **
	85 and over			Reference		Reference		Reference		Reference	
Sex	Missing			-341.41	-1.22	-239.50	-0.92	-207.87	-0.81	-277.67	-1.20
	Female			-329.64	-15.43 **	-5.78	-0.29	54.87	2.68 **	-120.51	-6.66 **
	Male			Reference		Reference		Reference		Reference	
Physicians per Capita	Less than 0.001			-241.88	-9.46 **	-177.71	-7.45 **	-152.89	-6.51 **	-20.04	-0.95
	0.001 to 0.002			-217.53	-9.96 **	-166.90	-8.19 **	-145.54	-7.25 **	-27.29	-1.52
	0.0021 to 0.003			-59.13	-2.86 **	-47.12	-2.45 *	-32.19	-1.70	17.10	1.00
	Greater than 0.003			Reference		Reference		Reference		Reference	
Hospital Beds per Capita	Less than 0.003			-227.69	-10.13 **	-191.18	-9.11 **	-188.71	-9.14 **	-114.69	-6.19 **
	0.003 to 0.006			-106.67	-5.29 **	-74.48	-3.96 **	-79.10	-4.27 **	-12.96	-0.78
	Greater than 0.006			Reference		Reference		Reference		Reference	
ARF Variables Missing				-279.80	-1.27	144.18	0.70	104.42	0.52	294.01	1.62
Rural/Urban Status	Missing			1520.42	6.04 **	983.92	4.19 **	946.50	4.09 **	423.43	2.04 *
	Urban			158.52	4.51 **	142.86	4.36 **	150.16	4.66 **	34.48	1.19
	Suburban			81.44	2.38 *	61.50	1.93 *	67.34	2.15 *	12.57	0.45
	Rural			-114.48	-3.05 **	-104.24	-2.98 **	-100.55	-2.92 **	-84.78	-2.74 **
	Very Rural			Reference		Reference		Reference		Reference	

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Table D.5—continued

	R-Squared	Base Case 0.25		VERA-3 0.28		VERA-10 0.38		VERA-47 0.39		VA DCGs 0.51	
Variable Category		**Estimate**	**t-Statistic**	**Estimate**	**t-Statistic**	**Estimate**	**t-Statistic**	**Estimate**	**t-Statistic**	**Estimate**	**t-Statistic**
Distance to Closest Facility	Missing			-3700.03	-44.23 **	-3027.64	-38.77 **	-2975.50	-38.67 **	-2258.58	-32.74 **
	Less than 30 miles			-2537.85	-35.30 **	-2359.28	-35.16 **	-2290.39	-34.62 **	-1925.26	-32.47 **
	31 to 100 miles			-2528.07	-35.29 **	-2307.44	-34.52 **	-2249.44	-34.14 **	-1761.69	-29.83 **
	101 to 250 miles			-2039.84	-27.98 **	-1782.90	-26.20 **	-1742.79	-26.00 **	-1348.60	-22.43 **
	Greater than 250 miles			Reference		Reference		Reference		Reference	
Distance to Closest CBOC	Missing			787.38	4.26 **	491.93	2.85 **	423.60	2.49 **	67.35	0.44
	Less than 30 miles			-258.68	-1.90	-270.94	-2.13 *	-300.67	-2.40 *	-194.22	-1.73
	31 to 100 miles			205.80	1.51	98.95	0.78	66.72	0.53	-39.95	-0.36
	Greater than 100 miles			Reference		Reference		Reference		Reference	
Medicare Reliance	Missing			2673.33	105.63 **	1992.33	84.38 **	1886.98	80.56 **	1245.55	59.55 **
	None			5912.28	212.09 **	4349.46	166.03 **	4271.45	165.03 **	2575.72	110.42 **
	1 to 24%			8235.78	272.24 **	6322.92	222.20 **	6206.43	220.66 **	3457.98	136.19 **
	25 to 49%			3320.80	92.65 **	2363.34	70.50 **	2353.86	71.22 **	914.41	30.79 **
	50 to 75%			1706.81	51.55 **	943.08	30.46 **	943.54	30.92 **	326.45	11.91 **
	75 to 100%			Reference		Reference		Reference		Reference	
Medicare Imputation Indicator				2535.67	80.99 **	1916.18	65.52 **	1882.98	65.39 **	1212.26	46.89 **
Medicaid Generosity LTC	Missing			-704.65	-2.55 **	-319.09	-1.24	-258.11	-1.02	-202.44	-0.89
	First Quartile (lowest)			650.42	10.95 **	563.39	10.16 **	520.36	9.54 **	344.59	7.03 **
	Second Quartile			442.32	8.60 **	364.37	7.60 **	339.85	7.20 **	222.86	5.26 **
	Third Quartile			479.06	10.92 **	436.46	10.67 **	408.61	10.15 **	226.52	6.26 **
	Fourth Quartile (highest)			Reference		Reference		Reference		Reference	
VERA 3 Patient Groups	Basic Care	3508.63	106.13 **	2248.10	113.50 **						
	Complex Care	36113.60	790.62 **	33715.85	954.09 **						
	Non-Vested	Reference		Reference							

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Table D.5—continued

		Base Case		VERA-3		VERA-10		VERA-47		VA DCGs	
	R-Squared	0.25		0.28		0.38		0.39		0.51	
Variable Category		Estimate	t-Statistic	Estimate	t-Statistic	Estimate	t-Statistic	Estimate	t-Statistic	Estimate	t-Statistic
VERA 10 Patient Groups	**Description**										
1	Non-Vested					-72506.09	-956.35 **				
2	Minor Medical					-71221.32	-955.56 **				
3	Mental Health					-70068.06	-913.22 **				
4	Heart and Lung					-69949.29	-932.67 **				
5	Oncology					-65720.86	-801.18 **				
6	Multiple Problem					-62389.41	-814.38 **				
7	Specialized Care					-52442.03	-577.23 **				
8	Supportive Care					-43420.72	-509.53 **				
9	Chronic Mental Illness					-31597.40	-327.67 **				
10	Critically Ill					Reference					
VERA 47 Patient Groups	**Description**										
10	Central Nervous System							-6283.30	-137.24 **		
11	Pulmonary Disease							-4491.82	-86.71 **		
12	Other Acute Disease							-6655.10	-157.73 **		
13	Ear, Nose and Throat							-6996.56	-143.75 **		
3a	Acute Mental Disease							-5625.36	-124.03 **		
3b	Addictive Disorder							-3554.32	-55.98 **		
4	Cardiovascular Disease							-5435.93	-126.37 **		
5	Oncology							-1357.56	-22.77 **		
6	Musculoskeletal Disorder							-5813.40	-125.76 **		
7	Gastoenterology Disorder							-4715.32	-94.86 **		
9	Endo Nutr Metab Disorder							-6324.23	-140.84 **		
90	Employee/Collaterals							-7751.16	-135.99 **		
Aa	Substance Abuse							31136.00	137.70 **		
B1	Blind Rehab							21815.69	89.51 **		
Hb	Hepatitis C Basic							-110.64	-1.49		
Hc	Hepatitis C Complex							2362.71	12.03 **		
L1	Ventilator							152765.69	465.70 **		
L2	Rehabilitation							59937.89	405.67 **		
L3	Specialized Care							71815.22	275.92 **		
L4	Clinical Complex							56908.67	338.84 **		

Table D.5—continued

		Base Case		VERA-3		VERA-10		VERA-47		VA DCGs	
	R-Squared	0.25		0.28		0.38		0.39		0.51	
Variable Category		Estimate	t-Statistic	Estimate	t-Statistic	Estimate	t-Statistic	Estimate	t-Statistic	Estimate	t-Statistic
L5	Behavioral							56492.87	149.32 **		
L6	Physical							58669.06	261.67 **		
L7	Low ADL							38649.67	301.64 **		
Lc	Community NH							25620.42	168.34 **		
Ld	Domicilliary							23902.40	156.09 **		
Lh	HBPC							14148.66	149.91 **		
Mh	Mental Health Intensive Case Management							28971.99	110.55 **		
Oa	Other Psychosis							28447.93	240.04 **		
Pa	PTSD							11528.34	98.87 **		
Pb	PTSD Acute							5312.31	45.42 **		
Ph	Pharmacy							-7512.63	-117.39 **		
Q1	SCI Quad-new Injury							58413.92	81.60 **		
Q2	SCI Quad-old Injury							22518.69	175.50 **		
Q3	SCI Para-new Injury							51271.89	55.34 **		
Q4	SCI Para-old Injury							16395.50	141.52 **		
Sa	Schizophrenia & Dementia							36309.01	404.09 **		
St	Stroke							16422.06	213.53 **		
Tb	Traumatic Brain Injury							14637.86	61.28 **		
XX	Transplants							67935.93	166.65 **		
Y	HIV without Retroviral Rx							-1110.18	-6.64 **		
a1	HIV with Retroviral RX							10604.43	109.79 **		
cp	Comp and Pen Exam							-7660.20	-117.92 **		
d1	ESRD							59873.03	374.81 **		
dd	Psych+Substance							3432.96	43.57 **		
mm	Multiple Medical							3033.23	63.65 **		
uv	Non-Vested							-7773.02	-176.78 **		
mp	Medical/Psych+Substance							Reference			
VA DCG Patient Groups											
	Missing									-169026.73	-196.80 **
	DCG 0.1									-169349.48	-197.19 **
	DCG 0.2									-168935.31	-196.66 **
	DCG 0.3									-168702.15	-196.30 **

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Table D.5—continued

	R-Squared	Base Case 0.25		VERA-3 0.28		VERA-10 0.38		VERA-47 0.39		VA DCGs 0.51	
Variable Category		Estimate	t-Statistic	Estimate	t-Statistic	Estimate	t-Statistic	Estimate	t-Statistic	Estimate	t-Statistic
	DCG 0.4									-168611.57	-196.07 **
	DCG 0.5									-168488.80	-196.10 **
	DCG 0.7									-168297.87	-195.92 **
	DCG 1									-167816.92	-195.37 **
	DCG 1.5									-167325.45	-194.77 **
	DCG 2									-167156.86	-194.54 **
	DCG 2.5									-166505.32	-193.82 **
	DCG 3									-165666.02	-192.84 **
	DCG 4									-164781.81	-191.78 **
	DCG 5									-163382.26	-190.18 **
	DCG 6									-160753.15	-187.11 **
	DCG 7.5									-155244.23	-180.68 **
	DCG 10									-141356.58	-164.51 **
	DCG 15									-124737.34	-145.03 **
	DCG 20									-116353.48	-135.02 **
	DCG 25									-105592.10	-122.11 **
	DCG 30									-88993.92	-102.72 **
	DCG 40									-64150.58	-72.96 **
	DCG 50									-33451.69	-36.51 **
	DCG 60									-14964.17	-14.88 **
	DCG 70									Reference	
VISN	(Code) Facility Location										
21	(358) VARO&OPC Manila, PI	-1951.73	-7.95 **	-825.05	-3.45 **	-327.02	-1.47	-333.18	-1.52	-15.32	-0.08
1	(402) Togus, ME	377.76	3.43 **	1139.33	7.03 **	1147.25	7.59 **	1084.01	7.28 **	1028.64	7.70 **
1	(405) White River Junction, VT	628.74	4.89 **	1043.17	6.23 **	1159.51	7.43 **	1093.16	7.12 **	924.79	6.70 **
19	(436) Fort Harrison, MT	-382.92	-3.20 **	-403.53	-2.45 *	-114.44	-0.75	-160.30	-1.06	-183.59	-1.35
13	(437) Fargo, ND	- 92.30	-0.73	145.19	0.88	201.64	1.31	116.02	0.77	-32.97	-0.24
13	(438) Sioux Falls, SD	394.40	3.01 **	456.40	2.78 **	349.93	2.29 *	354.05	2.35 *	-404.02	-2.99 **
19	(442) Cheyenne, WY	640.27	3.80 **	998.79	5.40 **	763.58	4.43 **	767.28	4.52 **	926.22	6.08 **
15	(452) Wichita, KS	6 5.26	0.49	189.65	1.13	324.93	2.08 *	242.42	1.58	180.08	1.30
21	(459) Honolulu, VAMROC, HI	580.54	4.55 **	901.14	5.34 **	1246.10	7.91 **	1199.64	7.74 **	1311.25	9.42 **
4	(460) Wilmington, DE	120.19	0.94	817.65	4.86 **	730.05	4.65 **	721.84	4.67 **	480.70	3.46 **
20	(463) Anchorage, AK	2216.99	15.82 **	3004.40	16.29 **	3373.52	19.60 **	3257.16	19.23 **	2853.00	18.76 **

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Table D.5—continued

		Base Case		VERA-3		VERA-10		VERA-47		VA DCGs	
	R-Squared	0.25		0.28		0.38		0.39		0.51	
Variable Category		Estimate	t-Statistic	Estimate	t-Statistic	Estimate	t-Statistic	Estimate	t-Statistic	Estimate	t-Statistic
VISN	(Code) Facility Location										
2	(500) VAMC Albany, NY	-1946.28	-14.14 **	33.39	0.20	265.97	1.72	246.66	1.62	256.33	1.87
18	(501) Albuquerque, NM	1106.38	11.76 **	804.88	5.27 **	818.18	5.74 **	778.19	5.55 **	589.15	4.68 **
16	(502) Alexandria, LA	59.83	0.55	592.18	3.67 **	522.07	3.47 **	486.10	3.28 **	617.28	4.64 **
4	(503) Altoona, PA	-765.79	-5.81 **	680.59	3.99 **	817.80	5.14 **	762.81	4.87 **	793.39	5.64 **
18	(504) Amarillo, TX	447.58	3.94 **	234.30	1.45	405.12	2.69 **	331.08	2.24 *	226.92	1.71
11	(506) Ann Arbor, MI	2945.56	26.01	3051.89	18.99 **	2558.56	17.06 **	2464.30	16.70 **	2159.97	16.30 **
7	(508) Atlanta, GA	599.69	6.78 **	1410.05	9.27 **	1505.66	10.61 **	1461.54	10.47 **	860.15	6.86 **
7	(509) Augusta, GA	2260.68	20.28 **	1878.45	11.71 **	1785.69	11.94 **	1810.19	12.29 **	1212.12	9.17 **
5	(512) Baltimore/Loch Raven, MD	1574.84	17.84 **	2207.28	14.54 **	2107.08	14.87 **	1962.39	14.08 **	1718.83	13.73 **
2	(514) VAMC Bath, NY	-3276.20	-13.81 **	-1354.69	-6.01 **	-399.96	-1.90	-442.17	-2.14 *	3.24	0.02
11	(515) Battle Creek, MI	950.62	7.79 **	1363.62	8.23 **	1153.37	7.46 **	1070.95	7.04 **	1757.33	12.86 **
8	(516) Bay Pines, FL	483.77	5.57 **	1024.35	6.77 **	1032.11	7.31 **	995.52	7.17 **	441.98	3.54 **
6	(517) Beckley, WV	424.02	2.74 **	567.10	3.17 **	601.49	3.60 **	627.84	3.82 **	-56.21	-0.38
1	(518) Bedford (Nourse) MA	2894.05	17.01 **	3116.95	16.80 **	2033.75	11.75 **	2008.40	11.79 **	2687.42	17.57 **
18	(519) Big Spring, TX	-159.43	-1.16	66.26	0.38	331.85	2.02 *	213.85	1.32	340.84	2.35 *
16	(520) Biloxi, MS	101.39	1.13	492.95	3.22 **	634.06	4.44 **	636.94	4.53 **	444.19	3.52 **
7	(521) Birmingham, AL	729.21	7.71 **	1265.07	8.21 **	1451.80	10.09 **	1362.34	9.62 **	1006.43	7.92 **
1	(523) Boston (Jamaica Plain), MA	3175.45	36.73 **	3689.05	24.28 **	3275.81	23.11 **	3156.03	22.62 **	2515.00	20.08 **
3	(526) Bronx, NY	2338.69	20.86 **	2892.92	17.91 **	2622.72	17.40 **	2505.07	16.89 **	2578.21	19.36 **
3	(527) Brooklyn, NY	1924.16	16.55 **	2499.25	15.61 **	2036.26	13.63 **	1944.62	13.23 **	1695.24	12.84 **
2	(528) Buffalo, NY	2345.54	28.34 **	2294.14	15.37 **	1982.35	14.24 **	1889.63	13.79 **	1617.26	13.14 **
4	(529) Butler, PA	-176.15	-1.27	1248.55	7.26 **	1190.73	7.43 **	1129.65	7.16 **	1169.79	8.26 **
20	(531) Boise, ID	797.03	6.00 **	1010.19	5.87 **	918.28	5.72 **	851.77	5.39 **	-552.95	-3.90 **
2	(532) VAMC Canandaigua, NY	3787.40	16.16 **	3652.86	16.50 **	3373.52	16.33 **	3316.70	16.31 **	3773.72	20.68 **
7	(534) Charleston, SC	340.58	3.44 **	542.02	3.45 **	744.42	5.08 **	734.91	5.10 **	881.77	6.81 **
12	(537) VA Chicago-Westside, IL	1504.95	16.89 **	2026.83	13.26 **	1853.67	12.99 **	1770.69	12.61 **	1390.21	11.03 **
10	(538) Chillicothe, OH	2152.96	15.77 **	2783.86	16.04 **	2558.90	15.80 **	2332.74	14.63 **	2091.93	14.62 **
10	(539) Cincinnati, OH	2855.14	24.81 **	3435.93	21.08 **	2935.03	19.30 **	2815.51	18.81 **	1346.50	10.02 **
4	(540) Clarksburg, WV	697.94	5.46 **	843.87	4.96 **	964.48	6.07 **	909.68	5.82 **	561.83	4.00 **
10	(541) Cleveland-Wade Park, OH	131.63	1.62	1446.01	9.63 **	1352.79	9.65 **	1239.51	8.99 **	905.59	7.31 **
4	(542) Coatesville, PA	1396.74	9.18 **	2159.65	12.43 **	1503.67	9.28 **	1336.23	8.37 **	2236.37	15.61 **
15	(543) Columbia, MO	1034.26	8.91 **	1102.36	6.76 **	1094.56	7.19 **	1021.26	6.82 **	343.53	2.55 *
7	(544) Columbia, SC	-87.89	-0.96	297.65	1.92	542.10	3.75 **	494.18	3.47 **	532.65	4.16 **
8	(546) Miami, FL	1847.81	19.74 **	1954.05	12.08 **	1764.82	11.69 **	1748.26	11.77 **	1927.89	14.45 **

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Table D.5—continued

		Base Case		VERA-3		VERA-10		VERA-47		VA DCGs	
	R-Squared	0.25		0.28		0.38		0.39		0.51	
Variable Category		Estimate	t-Statistic	Estimate	t-Statistic	Estimate	t-Statistic	Estimate	t-Statistic	Estimate	t-Statistic
VISN	(Code) Facility Location										
8	(548) West Palm Beach, FL	145.33	1.50	876.70	5.75 **	708.98	4.99 **	652.59	4.67 **	733.43	5.83 **
17	(549) Dallas, TX	611.38	7.94 **	1251.85	8.33 **	1282.47	9.15 **	1273.91	9.23 **	722.46	5.83 **
11	(550) Danville, IL	115.95	1.02	253.59	1.59	163.34	1.10	182.17	1.24	118.58	0.90
10	(552) Dayton, OH	1456.43	13.24 **	2375.40	14.74 **	1935.38	12.87 **	1811.48	12.24 **	1672.61	12.59 **
11	(553) Detroit, MI	1 420.20	14.23 **	2085.53	13.25 **	1786.41	12.17 **	1689.02	11.69 **	1765.21	13.61 **
19	(554) Denver, CO	1422.95	13.60 **	2631.30	16.39 **	2477.41	16.54 **	2403.71	16.31 **	503.15	3.80 **
14	(555) Des Moines, IA	-1345.48	-8.53 **	-574.35	-3.25 **	-249.35	-1.51	-264.76	-1.63	-423.49	-2.90 **
12	(556) North Chicago, IL	1716.55	12.53 **	1893.37	11.28 **	1656.40	10.58 **	1641.33	10.65 **	2007.77	14.51 **
7	(557) Dublin, GA	-412.47	-3.27 **	206.37	1.24	111.13	0.71	105.28	0.69	66.38	0.48
6	(558) Durham, NC	1865.10	17.82 **	2054.15	12.96 **	1696.76	11.47 **	1518.67	10.44 **	1248.53	9.55 **
3	(561) East Orange, NJ	1800.43	20.39 **	2044.33	13.64 **	2070.83	14.81 **	2029.80	14.75 **	2208.52	17.87 **
4	(562) Erie, PA	84.36	0.61	899.76	5.22 **	1042.41	6.48 **	958.70	6.06 **	1004.64	7.07 **
16	(564) Fayetteville, AR	-408.33	-3.49 **	-98.19	-0.61	219.95	1.45	154.78	1.04	270.10	2.02 *
6	(565) Fayetteville, NC	-701.77	-6.64 **	79.00	0.49	184.54	1.23	126.37	0.86	307.78	2.32 *
19	(567) Fort Lyon, CO	829.32	5.42 **	1815.09	9.77 **	1791.63	10.33 **	1708.52	10.01 **	2019.77	13.18 **
13	(568) Black Hills-Fort Meade, SD	1228.39	9.10 **	1125.66	6.77 **	932.22	6.01 **	885.89	5.80 **	429.21	3.13 **
21	(570) Fresno, CA	738.06	6.26 **	1203.40	7.25 **	1152.99	7.45 **	1090.25	7.16 **	816.97	5.97 **
8	(573) Gainesville, FL	210.56	2.77 **	883.94	5.98 **	692.35	5.02 **	657.84	4.85 **	219.80	1.80
19	(575) Grand Junction, CO	581.25	3.36 **	861.88	4.47 **	836.45	4.65 **	697.58	3.94 **	460.88	2.90 **
12	(578) Hines, IL	2454.93	24.77 **	2444.53	15.78 **	2185.58	15.12 **	2097.93	14.75 **	1684.28	13.19 **
16	(580) Houston, TX	1289.98	15.89 **	1316.68	8.67 **	1408.37	9.94 **	1339.43	9.61 **	1254.18	10.02 **
9	(581) Huntington, WV	86.99	0.79	423.82	2.65 **	633.29	4.24 **	549.39	3.74 **	340.73	2.58 **
11	(583) Indianapolis, IN	1474.90	14.97 **	1423.62	9.25 **	1385.39	9.65 **	1292.92	9.15 **	497.09	3.92 **
14	(584) Iowa City, IA	993.50	8.79 **	972.00	6.10 **	1145.75	7.70 **	1057.89	7.23 **	397.34	3.02 **
12	(585) Iron Mountain, MI	-304.63	-1.97 *	20.07	0.11	76.44	0.45	26.06	0.16	239.32	1.61
16	(586) Jackson, MS	816.37	8.35 **	750.40	4.77 **	639.64	4.36 **	619.17	4.29 **	271.46	2.09 *
15	(589) Kansas City, MO	1188.10	11.13 **	1576.86	9.95 **	1419.43	9.60 **	1332.38	9.15 **	219.01	1.68
6	(590) Hampton, VA	559.84	4.95 **	902.65	5.45 **	827.93	5.35 **	743.65	4.89 **	350.16	2.56 *
22	(593) Las Vegas, NV	-135.64	-1.33	751.16	4.64 **	845.47	5.60 **	814.85	5.49 **	836.64	6.27 **
4	(595) Lebanon, PA	371.82	3.33 **	1493.58	9.25 **	1352.62	8.98 **	1217.45	8.21 **	1304.50	9.80 **
9	(596) Lexington, Leestown, KY	1666.59	15.52 **	1565.81	9.83 **	1313.89	8.85 **	1315.63	9.00 **	829.28	6.32 **
14	(597) Lincoln, NE	-1369.63	-7.87 **	-383.24	-2.10 *	-5.32	-0.03	-25.94	-0.15	306.48	2.04 *

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Table D.5—continued

		Base Case		VERA-3		VERA-10		VERA-47		VA DCGs	
	R-Squared	0.25		0.28		0.38		0.39		0.51	
Variable Category		Estimate	t-Statistic	Estimate	t-Statistic	Estimate	t-Statistic	Estimate	t-Statistic	Estimate	t-Statistic
VISN	(Code) Facility Location										
16	(598) Little Rock, AR	2013.05	22.89 **	1859.62	12.28 **	1838.99	13.01 **	1750.11	12.58 **	1364.73	10.93 **
22	(600) Long Beach, CA	2179.84	22.59 **	2670.89	17.22 **	2340.24	16.18 **	2324.44	16.33 **	1761.71	13.78 **
9	(603) Louisville, KY	613.92	6.03 **	1054.38	6.87 **	1100.07	7.68 **	1045.59	7.42 **	916.04	7.23 **
22	(605) Loma Linda, CA	855.41	9.05 **	1647.87	10.61 **	1427.14	9.85 **	1375.60	9.65 **	1079.49	8.43 **
12	(607) Madison, WI	1999.59	16.03 **	2334.69	14.11 **	1961.17	12.71 **	1896.59	12.49 **	27.42	0.20
1	(608) Manchester, NH	193.88	1.40	1322.37	7.62 **	866.35	5.35 **	785.88	4.93 **	1012.15	7.08 **
15	(609) Marion, IL	-730.99	-7.14 **	-128.89	-0.82	154.76	1.06	92.60	0.64	-331.36	-2.56 *
11	(610) NIHCS-Marion, IN	1399.92	10.95 **	1772.02	10.62 **	1669.58	10.72 **	1545.35	10.08 **	1808.34	13.14 **
21	(612) NCHCS/Martinez, CA	-388.90	-4.49 **	400.92	2.64 **	340.65	2.41 *	265.11	1.90	-40.31	-0.32
5	(613) Martinsburg, WV	988.94	8.59 **	1372.83	8.50 **	1311.16	8.70 **	1232.82	8.31 **	790.37	5.93 **
9	(614) Memphis, TN	1298.55	13.48 **	1469.41	9.57 **	1480.31	10.34 **	1457.82	10.34 **	767.68	6.07 **
13	(618) Minneapolis, MN	1986.26	22.60 **	2232.12	14.80 **	2061.58	14.66 **	1972.62	14.25 **	656.66	5.29 **
7	(619) CAVHCS- Montgomery, AL	1063.40	10.51 **	1731.55	10.98 **	1759.88	11.96 **	1758.00	12.14 **	1817.12	13.98 **
3	(620) Montrose, NY	2084.24	17.73 **	2548.72	15.95 **	2679.84	17.97 **	2557.65	17.42 **	2518.07	19.10 **
9	(621) Mountain Home, TN	888.24	8.01 **	1047.04	6.54 **	859.20	5.75 **	716.71	4.88 **	-126.62	-0.96
9	(622) Murfreesboro, TN	355.24	3.21 **	748.05	4.68 **	526.27	3.53 **	442.99	3.02 **	369.38	2.80 **
16	(623) Muskogee, OK	-143.64	-1.31	160.01	0.97	588.61	3.83 **	536.61	3.55 **	395.80	2.91 **
9	(626) Nashville, TN	1095.97	11.48 **	1563.14	10.10 **	1405.36	9.73 **	1337.90	9.41 **	724.95	5.68 **
16	(629) New Orleans, LA	1561.71	15.99 **	1875.51	11.97 **	1782.08	12.20 **	1757.98	12.22 **	1585.15	12.28 **
3	(630) New York, NY	3272.00	31.92 **	3684.70	23.48 **	3480.94	23.78 **	3382.98	23.48 **	2806.32	21.69 **
1	(631) Northampton, MA	196.23	1.25	1150.95	6.27 **	1262.05	7.37 **	1186.99	7.04 **	937.83	6.19 **
3	(632) Northport, NY	2394.31	22.46 **	2619.12	16.81 **	2424.32	16.68 **	2371.19	16.58 **	2193.48	17.07 **
16	(635) Oklahoma City, OK	307.24	3.44 **	564.14	3.63 **	688.13	4.75 **	619.98	4.35 **	224.25	1.75
14	(636) Omaha, NE	2704.31	24.71 **	2051.33	12.93 **	1850.70	12.51 **	1672.83	11.49 **	748.61	5.72 **
6	(637) Asheville, NC	1457.98	11.94 **	1164.37	7.01 **	1166.98	7.53 **	1048.11	6.87 **	844.34	6.16 **
21	(640) Palo Alto, CA	3496.90	37.04 **	3327.85	21.86 **	3021.26	21.27 **	3009.66	21.53 **	2868.49	22.85 **
4	(642) Philadelphia, PA	845.47	9.06 **	1927.65	12.62 **	1709.44	11.99 **	1665.77	11.87 **	1733.73	13.76 **
18	(644) Phoenix, AZ	766.53	8.49 **	1257.72	8.07 **	1293.82	8.90 **	1233.50	8.62 **	490.55	3.82 **
4	(646) Pittsburgh-University Drive, PA	2469.00	26.94 **	3050.93	19.99 **	2355.64	16.55 **	2246.77	16.03 **	1897.78	15.09 **
15	(647) VAMC Poplar Bluff, MO	-580.60	-4.11 **	-121.43	-0.69	88.85	0.54	81.52	0.51	87.90	0.61
20	(648) Portland, OR	2262.44	23.88 **	2590.80	16.83 **	2229.17	15.52 **	2226.41	15.75 **	1162.91	9.16 **
18	(649) Prescott, AZ	- 93.60	-0.62	-187.47	-1.03	-302.19	-1.78	-435.12	-2.61 **	-34.96	-0.23
1	(650) Providence, RI	278.42	2.40 *	1304.36	7.89 **	1110.99	7.20 **	1032.77	6.81 **	440.79	3.23 **

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Table D.5—continued

		Base Case		VERA-3		VERA-10		VERA-47		VA DCGs	
	R-Squared	0.25		0.28		0.38		0.39		0.51	
Variable Category		Estimate	t-Statistic	Estimate	t-Statistic	Estimate	t-Statistic	Estimate	t-Statistic	Estimate	t-Statistic
VISN	(Code) Facility Location										
6	(652) Richmond, VA	2250.84	22.00 **	1723.23	10.94 **	1609.59	10.95 **	1589.48	10.99 **	869.83	6.70 **
20	(653) Roseburg, OR	457.12	3.57 **	786.32	4.64 **	725.39	4.59 **	684.12	4.40 **	647.18	4.63 **
21	(654) Reno, NV	310.50	2.59 **	406.96	2.44 *	475.90	3.06 **	398.56	2.61 **	164.79	1.20
11	(655) Saginaw, MI	6 7.93	0.52	601.90	3.53 **	584.35	3.68 **	513.12	3.28 **	749.83	5.34 **
13	(656) St. Cloud, MN	225.08	1.47	632.97	3.60 **	138.13	0.84	-50.88	-0.32	351.43	2.43 *
15	(657) St Louis, John Cochrane, MO	1169.41	12.41 **	1707.11	11.03 **	1417.57	9.81 **	1329.87	9.36 **	903.75	7.08 **
6	(658) Salem, VA	1090.72	10.05 **	1057.55	6.53 **	779.19	5.16 **	742.06	4.99 **	484.65	3.63 **
6	(659) Salisbury, NC	109.19	1.08	995.31	6.35 **	1176.57	8.04 **	1002.57	6.96 **	1294.10	10.01 **
19	(660) Salt Lake City, UT	1685.66	16.05 **	1674.77	10.63 **	1670.91	11.37 **	1573.51	10.88 **	648.33	4.99 **
21	(662) San Francisco, CA	3062.03	28.93 **	2995.91	18.88 **	2917.16	19.70 **	2896.40	19.88 **	2497.46	19.09 **
20	(663) Seattle, WA	1007.39	12.33 **	1785.07	11.88 **	1712.55	12.21 **	1645.54	11.92 **	1049.14	8.47 **
22	(664) San Diego, CA	1562.06	17.14 **	2573.22	16.69 **	2631.95	18.29 **	2598.49	18.35 **	2294.56	18.05 **
19	(666) Sheridan, WY	1380.55	6.70 **	883.37	4.32 **	863.62	4.52 **	784.38	4.18 **	709.94	4.21 **
16	(667) Shreveport, LA	517.50	5.16 **	918.93	5.88 **	999.63	6.85 **	971.07	6.76 **	491.35	3.81 **
20	(668) Spokane, WA	13.40	0.11	528.58	3.15 **	501.49	3.20 **	459.34	2.98 **	90.11	0.65
2	(670) VAMC Syracuse, NY	-3057.84	-16.06 **	-921.03	-4.67 **	-150.54	-0.82	-227.66	-1.26	-80.07	-0.49
17	(671) San Antonio, TX	932.85	11.48 **	1234.71	8.13 **	1068.73	7.55 **	1050.85	7.54 **	840.05	6.71 **
8	(673) Tampa, FL	183.27	2.42 *	928.19	6.29 **	850.80	6.18 **	841.44	6.21 **	329.46	2.71 **
17	(674) Temple, TX	729.66	8.62 **	972.50	6.35 **	957.55	6.70 **	865.06	6.15 **	714.83	5.66 **
12	(676) Tomah, WI	1398.41	8.36 **	1643.11	9.54 **	1598.37	9.95 **	1470.31	9.30 **	1535.74	10.81 **
15	(677) VAMC Topeka, KS	1213.06	10.90 **	1375.31	8.72 **	1286.08	8.74 **	1153.94	7.97 **	415.91	3.20 **
18	(678) Tucson, AZ	536.42	5.36 **	748.11	4.72 **	722.29	4.89 **	636.09	4.37 **	-245.61	-1.88
7	(679) Tuscaloosa, AL	1320.44	8.58 **	1305.44	7.27 **	893.86	5.33 **	872.32	5.29 **	957.52	6.47 **
20	(687) Walla Walla, WA	-337.08	-2.16 *	91.18	0.49	208.56	1.21	78.04	0.46	636.32	4.17 **
5	(688) Washington, DC	1451.31	15.33 **	2180.09	14.19 **	2152.30	15.02 **	2155.64	15.28 **	1928.44	15.23 **
1	(689) VACHS, West Haven, CT	1583.86	16.73 **	2235.79	14.56 **	1989.29	13.88 **	1940.50	13.76 **	2017.77	15.93 **
22	(691) West Los Angeles, CA	2287.25	29.35 **	2839.79	19.13 **	2503.21	18.07 **	2481.16	18.20 **	2258.27	18.45 **
20	(692) White City, OR	-3213.22	-16.90 **	-2019.56	-9.78 **	-1743.48	-9.04 **	-1926.31	-10.13 **	-2226.52	-13.07 **
4	(693) Wilkes-Barre, PA	606.19	6.05 **	1622.33	10.37 **	1513.52	10.37 **	1448.69	10.09 **	1191.34	9.24 **
12	(695) Milwaukee, WI	1651.13	16.37 **	2136.41	13.69 **	1951.33	13.41 **	1853.59	12.94 **	1413.11	10.98 **
18	(756) El Paso, TX	-675.41	-5.64 **	-255.12	-1.49	264.68	1.66	168.89	1.08	429.94	3.05 **
10	(757) Columbus IOC, OH	-925.35	-7.55 **	571.82	3.40 **	842.85	5.38 **	788.80	5.11 **	522.12	3.77 **
8	(672) San Juan, PR	Reference		Reference		Reference		Reference		Reference	

* Indicates statistical significance at 95% confidence level.

** Indicates statistical significance at 99% confidence level.

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NOTE: The data on physicians per capita and hospital beds per capita from the ARF data were missing for the same group of individuals. As a result, only one missing category can be estimated between the two variables. That estimate is reported in the row labeled ARF Variables Missing.

Table D.6

Facility-Level Regression Results for the Policy Model (Including Basic Care Priority 7s)

R-Squared	Base Case		VERA-3		VERA-10		VERA-47		VA DCGs	
	0.35		0.46		0.44		0.45		0.39	
Variable	**Estimate**	**t-Statistic**	**Estimate**	**t-Statistic**	**Estimate**	**t-Statistic**	**Estimate**	**t-Statistic**	**Estimate**	**t-Statistic**
Intercept	-2597.02	-1.16	-3222.77	-1.68	-2940.80	-1.78	-2968.18	-1.82	-3440.95	-2.04 *
Rural/Urban Status										
Urban			-188.81	-0.32	-304.60	-0.61	-273.23	-0.55	-456.41	-0.89
Suburban			-564.75	-0.94	-591.09	-1.15	-554.96	-1.09	-819.71	-1.56
Rural			-375.21	-0.55	-412.48	-0.71	-399.14	-0.69	-595.04	-1.00
Very Rural			Reference		Reference		Reference		Reference	
Residents per Full-time MD	500.63	2.43 *	249.09	1.26	170.52	1.00	165.70	0.99	-435.57	-2.51 *
VA Labor Index	2729.02	1.22	3816.87	1.88	3873.47	2.22 *	3816.30	2.21 *	4276.25	2.40 *
Average Food Cost per Bed Day			33.68	1.68	24.99	1.45	24.57	1.44	13.45	0.76
Energy Price (dollars per million BTUs)			20.81	0.38	8.00	0.17	7.01	0.15	52.37	1.08
Contract Labor Costs			-5805.50	-2.36 *	-4086.45	-1.93	-3856.39	-1.84	-4965.18	-2.29 *
Square Feet of Building Space per Acre of Land			3.99	1.44	4.69	1.97	4.57	1.94	5.81	2.39 *
Square Feet of building Space per Unique Patient			8.21	2.40 *	4.55	1.54	4.13	1.42	5.07	1.68
Research Costs per 1000 Unique Patients	0.006	5.17 **	0.005	5.01 **	0.004	4.92 **	0.004	5.10 **	0.004	5.24 **

* Indicates statistical significance at 95% confidence level.

** Indicates statistical significance at 99% confidence level.

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Table D.7

Comparison of FY 2002 Actual Allocations with Simulated Allocations (in $1,000) for the Policy Model (Including Basic Care Priority 7s)

VISN	FY02 Allocations	VERA -3	Diff from FY02	VERA-10	Diff from FY02	VERA-47	Diff from FY02	VA DCGs	Diff from FY02
01 Boston	909,715	938,813	3.2%	943,459	3.7%	946,135	4.0%	933,191	2.6%
02 Albany	497,198	527,743	6.1%	520,187	4.6%	520,841	4.8%	521,244	4.8%
03 Bronx	1,037,301	947,395	-8.7%	947,386	-8.7%	947,131	-8.7%	941,759	-9.2%
04 Pittsburgh	936,020	823,659	-12.0%	868,640	-7.2%	872,738	-6.8%	832,633	-11.0%
05 Baltimore	564,929	500,176	-11.5%	497,432	-11.9%	499,420	-11.6%	503,936	-10.8%
06 Durham	861,286	879,619	2.1%	879,211	2.1%	883,431	2.6%	886,487	2.9%
07 Atlanta	1,050,304	1,076,480	2.5%	1,049,046	-0.1%	1,040,887	-0.9%	1,004,898	-4.3%
08 Bay Pines	1,437,387	1,456,046	1.3%	1,474,971	2.6%	1,461,339	1.7%	1,496,759	4.1%
09 Nashville	831,591	911,780	9.6%	902,611	8.5%	901,687	8.4%	894,294	7.5%
10 Cincinnati	682,951	533,563	-21.9%	557,981	-18.3%	565,951	-17.1%	587,560	-14.0%
11 Ann Arbor	750,330	794,963	5.9%	805,231	7.3%	806,587	7.5%	773,813	3.1%
12 Chicago	883,268	906,379	2.6%	913,432	3.4%	914,218	3.5%	908,183	2.8%
13 Minneapolis	508,738	510,943	0.4%	524,113	3.0%	526,236	3.4%	577,859	13.6%
14 Lincoln	348,050	353,722	1.6%	345,477	-0.7%	348,875	0.2%	351,037	0.9%
15 Kansas City	703,102	728,121	3.6%	722,863	2.8%	725,758	3.2%	745,242	6.0%
16 Jackson	1,466,801	1,550,866	5.7%	1,521,632	3.7%	1,517,074	3.4%	1,474,117	0.5%
17 Dallas	832,097	828,237	-0.5%	822,333	-1.2%	817,923	-1.7%	803,646	-3.4%
18 Phoenix	715,290	764,759	6.9%	747,624	4.5%	750,369	4.9%	750,780	5.0%
19 Denver	473,985	450,239	-5.0%	453,184	-4.4%	454,646	-4.1%	488,247	3.0%
20 Portland	824,844	780,661	-5.4%	781,970	-5.2%	782,724	-5.1%	841,662	2.0%
21 San Francisco	931,506	1,016,096	9.1%	995,961	6.9%	994,899	6.8%	993,935	6.7%
22 Long Beach	1,062,308	1,028,743	-3.2%	1,034,256	-2.6%	1,030,134	-3.0%	997,720	-6.1%
23 Lincoln & Minneapolis	856,788	864,665	0.9%	869,590	1.5%	875,111	2.1%	928,896	8.4%

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Table D.8

Patient-Level Regression Results for the Fully Specified Model (Including Basic Care Priority 7s)

		Base Case		VERA-3		VERA-10		VERA-47		VA DCGs	
	R-Squared	0.25		0.30		0.38		0.40		0.51	
Variable Category		Estimate	t-Statistic	Estimate	t-Statistic	Estimate	t-Statistic	Estimate	t-Statistic	Estimate	t-Statistic
Intercept		-644.70	-10.28 **	-1523.13	-6.89 **	68379.64	312.47 **	5192.60	25.10 **	167736.26	191.51 **
Age	Missing			-492.37	-7.71 **	-44.62	-0.75	-22.49	-0.38	725.34	13.66 **
	Less than 25			-1328.27	-20.31 **	-696.53	-11.35 **	-647.12	-10.69 **	325.22	5.97 **
	25-34			-1562.43	-29.94 **	-869.60	-17.75 **	-809.70	-16.73 **	317.91	7.32 **
	35-44			-1180.09	-24.23 **	-647.11	-14.13 **	-596.31	-13.17 **	486.58	12.01 **
	45-54			-650.64	-13.94 **	-233.26	-5.32 **	-149.94	-3.46 **	702.67	18.10 **
	55-64			122.70	2.61 **	351.97	7.98 **	425.06	9.77 **	921.03	23.56 **
	65-74			-183.16	-4.02 **	72.26	1.69	105.57	2.51 *	554.23	14.61 **
	75-84			26.33	0.57	173.51	4.03 **	202.17	4.77 **	355.64	9.31 **
	85 and over			Reference		Reference		Reference		Reference	
Income	Missing			222.89	6.08 **	311.05	9.03 **	264.82	7.81 **	-238.69	-7.83 **
	$20,000 or less			111.63	3.00 **	67.57	1.94 *	47.43	1.38	-471.74	-15.06 **
	$21,000 - $40,000			231.42	6.24 **	143.02	4.11 **	136.60	3.99 **	-315.41	-10.08 **
	$41,000 - $60,000			-56.43	-1.31	8.06	0.20	29.19	0.73	-112.86	-3.13 **
	$61,000 - $80,000			-255.52	-4.67 **	-28.91	-0.56	7.73	0.15	-87.33	-1.92
	More than $80,000			Reference		Reference		Reference		Reference	
Race	Missing			-2067.20	-142.95 **	-1563.06	-114.73 **	-1538.59	-114.12 **	-834.00	-68.59 **
	Hispanic			-582.92	-14.15 **	-380.67	-9.86 **	-374.27	-9.85 **	-215.31	-6.29 **
	American Indian			-471.39	-3.89 **	-465.91	-4.10 **	-488.10	-4.36 **	-343.05	-3.40 **
	Black			-65.51	-3.06 **	-22.06	-1.10	-37.96	-1.91 *	-11.27	-0.63
	Asian			-857.28	-8.81 **	-655.58	-7.18 **	-610.97	-6.81 **	-169.17	-2.09 *
	White			Reference		Reference		Reference		Reference	
Sex	Missing			-327.94	-1.19	-280.87	-1.08	-251.95	-0.99	-206.22	-0.90
	Female			-409.58	-18.18 **	-280.49	-13.25 **	-204.16	-9.64 **	-81.75	-4.28 **
	Male					Reference		Reference		Reference	
Marital Status	Missing			-980.95	-39.49 **	-372.02	-15.20 **	-425.26	-16.97 **	-551.61	-26.55 **
	Single			587.18	43.25 **	443.90	34.80 **	391.64	31.14 **	160.01	14.14 **
	Married			Reference		Reference		Reference		Reference	
Number of MDs per Capita	Less than 0.001			-199.30	-7.86 **	-143.53	-6.04 **	-130.39	-5.58 **	-17.28	-0.82
	0.001 to 0.002			-118.18	-5.46 **	-94.16	-4.64 **	-86.00	-4.31 **	-9.98	-0.55
	0.0021 to 0.003			-37.27	-1.82	-29.66	-1.55	-21.82	-1.16	15.68	0.92
	Greater than 0.003			Reference		Reference		Reference		Reference	

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Table D.8—continued

		Base Case		VERA-3		VERA-10		VERA-47		VA DCGs	
	R-Squared	0.25		0.30		0.38		0.40		0.51	
Variable Category		Estimate	t-Statistic	Estimate	t-Statistic	Estimate	t-Statistic	Estimate	t-Statistic	Estimate	t-Statistic
Hospital Beds per Capita	Less than 0.003			-165.65	-7.43 **	-133.43	-6.39 **	-137.00	-6.67 **	-107.52	-5.80 **
	0.003 to 0.006			-75.00	-3.75 **	-42.42	-2.27 *	-47.82	-2.60 **	-8.24	-0.50
	Greater than 0.006			Reference		Reference		Reference		Reference	
ARF Variables Missing				-319.95	-1.46	89.26	0.44	31.35	0.16	99.19	0.55
Rural/Urban Status	Missing			1398.60	5.60 **	906.03	3.87 **	896.79	3.89 **	616.10	2.97 **
	Urban			194.76	5.60 **	172.41	5.29 **	172.66	5.39 **	47.35	1.64
	Suburban			82.64	2.44 *	60.72	1.92	62.35	2.00 *	11.68	0.42
	Rural			-102.76	-2.77 **	-101.23	-2.91 **	-100.46	-2.94 **	-86.21	-2.79 **
	Very Rural			Reference		Reference		Reference		Reference	
Distance to Closest Facility	Missing			-3427.92	-41.45 **	-2924.28	-37.71 **	-2896.91	-37.92 **	-2204.42	-32.04 **
	Less than 30 miles			-2382.62	-33.51 **	-2263.97	-33.97 **	-2214.38	-33.71 **	-1874.44	-31.70 **
	31 to 100 miles			-2313.04	-32.66 **	-2148.18	-32.35 **	-2118.62	-32.38 **	-1695.13	-28.77 **
	101 to 250 miles			-1834.77	-25.45 **	-1633.02	-24.16 **	-1617.35	-24.30 **	-1283.08	-21.40 **
	Greater than 250 miles			Reference		Reference		Reference		Reference	
Distance to Closest CBOC	Missing			790.83	4.32 **	531.19	3.10 **	468.51	2.78 **	130.44	0.86
	Less than 30 miles			-277.41	-2.06 *	-249.86	-1.98 *	-288.44	-2.32 *	-221.21	-1.97 *
	31 to 100 miles			118.05	0.88	64.54	0.51	25.42	0.20	-80.82	-0.72
	Greater than 100 miles			Reference		Reference		Reference		Reference	
Priority Group	Missing			1051.04	4.01 **	521.90	2.12 *	598.88	2.48 *	-415.05	-1.90
	Priority 1			1900.84	80.86 **	1515.42	68.49 **	1598.76	72.41 **	364.74	17.93 **
	Priority 2			928.99	32.14 **	735.03	27.11 **	745.98	27.92 **	61.55	2.38 *
	Priority 3			680.49	26.93 **	577.85	24.37 **	570.35	24.41 **	-26.99	-1.16
	Priority 4			7364.46	203.20 **	5555.71	162.44 **	5744.51	169.59 **	2951.73	93.94 **
	Priority 5			711.15	33.29 **	579.17	28.92 **	545.76	27.67 **	-214.24	-10.64 **
	Priority 6			-10.53	-0.20	-6.39	-0.13	-10.87	-0.22	-317.80	-7.02 **
	Priority 7			Reference		Reference		Reference		Reference	

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Table D.8—continued

		Base Case		VERA-3		VERA-10		VERA-47		VA DCGs	
	R-Squared	0.25		0.30		0.38		0.40		0.51	
Variable Category		Estimate	t-Statistic	Estimate	t-Statistic	Estimate	t-Statistic	Estimate	t-Statistic	Estimate	t-Statistic
Medicare Reliance	Missing			3158.91	125.55 **	2413.18	102.25 **	2309.63	98.79 **	1466.75	69.83 **
	None			5288.65	189.99 **	4040.07	154.15 **	3972.54	153.56 **	2549.50	109.06 **
	1 to 24%			7648.22	254.36 **	6057.69	213.67 **	5946.83	212.38 **	3440.53	135.61 **
	25 to 49%			3003.92	84.66 **	2242.07	67.30 **	2234.34	68.07 **	902.79	30.46 **
	50 to 75%			1466.76	44.77 **	866.50	28.17 **	863.25	28.49 **	320.20	11.71 **
	75 to 100%			Reference		Reference		Reference		Reference	
Medicare Imputation Indicator				2455.72	79.22 **	1922.23	66.10 **	1890.84	66.07 **	1275.83	49.43 **
Medicaid Generosity General	Missing			-233.64	-0.85	-12.08	-0.05	14.59	0.06	-163.96	-0.72
	First Quartile (lowest)			-220.34	-2.85 **	-233.50	-3.22 **	-236.76	-3.32 **	-246.98	-3.84 **
	Second Quartile			128.77	2.18 *	100.32	1.81	91.91	1.69	2.29	0.05
	Third Quartile			266.13	6.77 **	256.95	6.98 **	246.36	6.80 **	193.43	5.92 **
	Fourth Quartile (highest)			Reference		Reference		Reference		Reference	
Medicaid Generosity Long-term Care	First Quartile (lowest)			781.97	10.74 **	699.37	10.25 **	651.73	9.71 **	474.47	7.84 **
	Second Quartile			437.55	7.32 **	369.59	6.60 **	341.82	6.20 **	232.04	4.67 **
	Third Quartile			468.12	10.32 **	421.85	9.92 **	397.16	9.50 **	225.63	5.98 **
	Fourth Quartile (highest)			Reference		Reference		Reference		Reference	
VERA 3 Patient Groups	Basic Care	3508.63	106.13 **	1400.59	67.01 **						
	Complex Care	36113.60	790.62 **	30607.69	829.67 **						
	Non-Vested	Reference		Reference							
VERA 10 Patient Groups											
1	Non-Vested					-69853.51	-909.74 **				
2	Minor Medical					-69018.08	-923.59 **				
3	Mental Health					-68334.31	-890.76 **				
4	Heart and Lung					-67722.62	-900.32 **				
5	Oncology					-63901.72	-779.40 **				
6	Multiple Problem					-60858.89	-795.21 **				

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Table D.8—continued

		Base Case		VERA-3		VERA-10		VERA-47		VA DCGs	
	R-Squared	0.25		0.30		0.38		0.40		0.51	
Variable Category		Estimate	t-Statistic	Estimate	t-Statistic	Estimate	t-Statistic	Estimate	t-Statistic	Estimate	t-Statistic
7	Specialized Care					-51456.89	-568.98 **				
8	Supportive Care					-43271.08	-511.24 **				
9	Chronic Mental Illness					-31426.03	-327.89 **				
10	Critically Ill					Reference					
VERA 47 Patient Groups											
10	Central Nervous System							-5703.27	-125.17 **		
11	Pulmonary Disease							-3895.73	-75.59 **		
12	Other Acute Disease							-5906.14	-140.39 **		
13	Ear, Nose and Throat							-6094.30	-125.60 **		
3a	Acute Mental Disease							-5337.60	-118.50 **		
3b	Addictive Disorder							-3403.51	-53.81 **		
4	Cardiovascular Disease							-4585.99	-106.82 **		
5	Oncology							-824.64	-13.91 **		
6	Musculoskeletal Disorder							-5068.50	-110.08 **		
7	Gastoenterology Disorder							-4041.96	-81.69 **		
9	Endo Nutr Metab Disorder							-5493.81	-122.66 **		
90	Employee/Collaterals							-6852.79	-116.19 **		
Aa	Substance Abuse							30271.49	134.78 **		
B1	Blind Rehab							19327.94	79.70 **		
Hb	Hepatitis C Basic							-13.53	-0.18		
Hc	Hepatitis C Complex							2745.65	14.09 **		
L1	Ventilator							151687.75	465.80 **		
L2	Rehabilitation							57964.38	394.17 **		
L3	Specialized Care							69041.62	266.78 **		
L4	Clinical Complex							55259.31	330.97 **		
L5	Behavioral							55238.73	147.07 **		
L6	Physical							57260.65	257.12 **		
L7	Low ADL							37744.61	296.50 **		
Lc	Community NH							24869.09	164.53 **		
Ld	Domicilliary							23356.56	153.47 **		
Lh	HBPC							13132.93	139.93 **		
Mh	Mental Health Intensive Case Management							27510.38	105.71 **		
Oa	Other Psychosis							27069.23	229.70 **		
Pa	PTSD							11099.12	95.77 **		
Pb	PTSD Acute							4755.87	40.95 **		

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Table D.8—continued

		Base Case		VERA-3		VERA-10		VERA-47		VA DCGs	
	R-Squared	0.25		0.30		0.38		0.40		0.51	
Variable Category		Estimate	t-Statistic	Estimate	t-Statistic	Estimate	t-Statistic	Estimate	t-Statistic	Estimate	t-Statistic
Ph	Pharmacy							-6335.25	-92.83 **		
Q1	SCI Quad-new Injury							56165.70	79.03 **		
Q2	SCI Quad-old Injury							20439.24	159.54 **		
Q3	SCI Para-new Injury							49218.21	53.52 **		
Q4	SCI Para-old Injury							14581.97	126.15 **		
Sa	Schizophrenia & Dementia							34946.65	390.35 **		
St	Stroke							15114.47	197.02 **		
Tb	Traumatic Brain Injury							13954.85	58.85 **		
XX	Transplants							67857.52	167.69 **		
Y	HIV without Retroviral Rx							-1023.56	-6.16 **		
a1	HIV with Retroviral RX							10654.18	110.91 **		
cp	Comp and Pen Exam							-6100.97	-92.41 **		
d1	ESRD							59145.73	372.74 **		
dd	Psych+Substance							2663.72	33.98 **		
mm	Multiple Medical							3280.02	69.27 **		
uv	Non-Vested							-6582.41	-146.54 **		
mp	Medical/Psych+Substance							Reference			
VA DCG Patient Groups											
	Missing									-167463.07	-195.52 **
	DCG 0.1									-167678.34	-195.80 **
	DCG 0.2									-167359.92	-195.39 **
	DCG 0.3									-167159.45	-195.06 **
	DCG 0.4									-167060.68	-194.82 **
	DCG 0.5									-166959.77	-194.88 **
	DCG 0.7									-166821.43	-194.76 **
	DCG 1									-166377.46	-194.25 **
	DCG 1.5									-165921.48	-193.69 **
	DCG 2									-165780.63	-193.49 **
	DCG 2.5									-165170.71	-192.82 **
	DCG 3									-164377.34	-191.90 **
	DCG 4									-163538.71	-190.88 **
	DCG 5									-162207.72	-189.36 **
	DCG 6									-159659.68	-186.38 **
	DCG 7.5									-154293.00	-180.10 **
	DCG 10									-140655.73	-164.17 **
	DCG 15									-124271.40	-144.91 **

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Table D.8—continued

		Base Case		VERA-3		VERA-10		VERA-47		VA DCGs	
	R-Squared	0.25		0.30		0.38		0.40		0.51	
Variable Category		Estimate	t-Statistic	Estimate	t-Statistic	Estimate	t-Statistic	Estimate	t-Statistic	Estimate	t-Statistic
	DCG 20									-115979.92	-134.99 **
	DCG 25									-105290.04	-122.11 **
	DCG 30									-88802.24	-102.80 **
	DCG 40									-63948.26	-72.95 **
	DCG 50									-33391.18	-36.56 **
	DCG 60									-14925.72	-14.88 **
	DCG 70									Reference	
VISN	(Code) Facility Location										
21	(358) VARO&OPC Manila, PI	-1951.73	-7.95 **	-938.00	-3.75 **	-574.68	-2.45 *	-613.05	-2.66 **	-352.10	-1.69
1	(402) Togus, ME	377.76	3.43 **	1661.77	10.08 **	1526.94	9.89 **	1452.63	9.56 **	1242.90	9.07 **
1	(405) White River Junction, VT	628.74	4.89 **	1845.62	10.85 **	1703.65	10.69 **	1658.27	10.57 **	1147.64	8.11 **
19	(436) Fort Harrison, MT	-382.92	-3.20 **	888.61	5.24 **	830.04	5.23 **	780.55	4.99 **	327.16	2.32 *
13	(437) Fargo, ND	-92.30	-0.73	929.91	5.53 **	736.83	4.67 **	658.39	4.24 **	233.37	1.67
13	(438) Sioux Falls, SD	394.40	3.01 **	1607.64	9.57 **	1184.39	7.53 **	1188.79	7.68 **	42.97	0.31
19	(442) Cheyenne, WY	640.27	3.80 **	1099.23	5.88 **	827.75	4.72 **	843.96	4.89 **	909.95	5.85 **
15	(452) Wichita, KS	65.26	0.49	706.33	4.13 **	679.31	4.24 **	614.57	3.90 **	370.19	2.60 **
21	(459) Honolulu, VAMROC, HI	580.54	4.55 **	1858.87	10.61 **	1959.79	11.93 **	1896.77	11.74 **	1648.45	11.31 **
4	(460) Wilmington, DE	120.19	0.94	1083.60	6.32 **	857.33	5.34 **	859.24	5.44 **	479.83	3.37 **
20	(463) Anchorage, AK	2216.99	15.82 **	4316.35	22.93 **	4287.12	24.30 **	4151.24	23.91 **	3281.49	20.96 **
2	(500) VAMC Albany, NY	-1946.28	-14.14 **	888.98	5.26 **	848.44	5.36 **	834.95	5.36 **	537.37	3.83 **
18	(501) Albuquerque, NM	1106.38	11.76 **	1717.66	10.97 **	1462.54	9.97 **	1417.53	9.82 **	1089.11	8.36 **
16	(502) Alexandria, LA	59.83	0.55	1135.43	6.86 **	918.82	5.92 **	900.01	5.90 **	890.14	6.47 **
4	(503) Altoona, PA	-765.79	-5.81 **	1777.67	10.16 **	1553.90	9.48 **	1508.80	9.35 **	1087.22	7.47 **
18	(504) Amarillo, TX	447.58	3.94 **	1181.76	7.13 **	1105.44	7.12 **	1044.08	6.83 **	656.00	4.76 **
11	(506) Ann Arbor, MI	2945.56	26.01	3792.13	23.12 **	3056.73	19.88 **	2980.31	19.71 **	2445.27	17.92 **
7	(508) Atlanta, GA	599.69	6.78 **	1872.26	11.96 **	1832.69	12.49 **	1809.47	12.53 **	1124.08	8.63 **
7	(509) Augusta, GA	2260.68	20.28 **	2058.54	12.55 **	1908.40	12.41 **	1964.89	12.99 **	1324.91	9.71 **
5	(512) Baltimore/Loch Raven, MD	1574.84	17.84 **	2645.02	16.77 **	2356.02	15.94 **	2246.52	15.45 **	1824.73	13.91 **
2	(514) VAMC Bath, NY	-3276.20	-13.81 **	-1103.53	-4.88 **	-301.78	-1.42	-298.89	-1.43	2.52	0.01
11	(515) Battle Creek, MI	950.62	7.79 **	1335.79	7.87 **	1093.47	6.88 **	1055.90	6.75 **	1672.66	11.85 **
8	(516) Bay Pines, FL	483.77	5.57 **	1588.72	10.20 **	1455.79	9.97 **	1431.42	9.97 **	716.17	5.53 **
6	(517) Beckley, WV	424.02	2.74 **	769.43	4.20 **	640.54	3.73 **	688.13	4.07 **	-20.57	-0.13
1	(518) Bedford (Nourse) MA	2894.05	17.01 **	3524.48	18.80 **	2347.98	13.36 **	2361.68	13.66 **	2788.71	17.88 **
18	(519) Big Spring, TX	-159.43	-1.16	450.78	2.51 *	600.15	3.57 **	518.00	3.13 **	550.12	3.68 **
16	(520) Biloxi, MS	101.39	1.13	957.04	6.13 **	964.34	6.59 **	979.52	6.80 **	707.06	5.44 **
7	(521) Birmingham, AL	729.21	7.71 **	2229.11	13.81 **	2224.80	14.71 **	2153.40	14.47 **	1545.24	11.51 **

Table D.8—continued

		Base Case		VERA-3		VERA-10		VERA-47		VA DCGs	
	R-Squared	0.25		0.30		0.38		0.40		0.51	
Variable Category		Estimate	t-Statistic	Estimate	t-Statistic	Estimate	t-Statistic	Estimate	t-Statistic	Estimate	t-Statistic
VISN	(Code) Facility Location										
1	(523) Boston (Jamaica Plain), MA	3175.45	36.73 **	4123.77	26.59 **	3618.40	24.89 **	3520.19	24.61 **	2726.20	21.13 **
3	(526) Bronx, NY	2338.69	20.86 **	3594.69	22.01 **	3142.39	20.53 **	3056.59	20.30 **	2854.77	21.01 **
3	(527) Brooklyn, NY	1924.16	16.55 **	3486.89	21.42 **	2731.60	17.90 **	2650.67	17.65 **	2112.93	15.60 **
2	(528) Buffalo, NY	2345.54	28.34 **	2989.50	19.60 **	2499.33	17.48 **	2414.98	17.17 **	1902.57	15.00 **
4	(529) Butler, PA	-176.15	-1.27	1872.89	10.64 **	1616.46	9.80 **	1583.00	9.75 **	1270.27	8.68 **
20	(531) Boise, ID	797.03	6.00 **	1680.90	9.52 **	1448.41	8.76 **	1389.03	8.53 **	-154.50	-1.05
2	(532) VAMC Canandaigua, NY	3787.40	16.16 **	3870.71	17.42 **	3526.97	16.94 **	3502.40	17.09 **	3779.70	20.46 **
7	(534) Charleston, SC	340.58	3.44 **	789.07	4.90 **	876.74	5.81 **	890.52	6.00 **	921.11	6.88 **
12	(537) VA Chicago-Westside, IL	1504.95	16.89 **	2136.23	13.56 **	1889.34	12.80 **	1838.70	12.66 **	1417.63	10.82 **
10	(538) Chillicothe, OH	2152.96	15.77 **	2947.78	16.76 **	2698.26	16.37 **	2521.04	15.54 **	2202.93	15.06 **
10	(539) Cincinnati, OH	2855.14	24.81 **	3905.25	23.58 **	3328.07	21.44 **	3217.98	21.07 **	1635.69	11.87 **
4	(540) Clarksburg, WV	697.94	5.46 **	1066.54	6.10 **	1067.97	6.52 **	1039.89	6.45 **	581.51	4.00 **
10	(541) Cleveland-Wade Park, OH	131.63	1.62	1936.60	12.62 **	1721.94	11.97 **	1644.23	11.62 **	1129.63	8.85 **
4	(542) Coatesville, PA	1396.74	9.18 **	3131.48	17.63 **	2194.85	13.18 **	2067.35	12.61 **	2415.56	16.35 **
15	(543) Columbia, MO	1034.26	8.91 **	1400.73	8.36 **	1306.07	8.32 **	1231.59	7.97 **	467.91	3.36 **
7	(544) Columbia, SC	-87.89	-0.96	721.49	4.53 **	773.29	5.18 **	734.08	5.00 **	645.36	4.87 **
8	(546) Miami, FL	1847.81	19.74 **	2774.27	16.77 **	2349.72	15.15 **	2330.48	15.27 **	2256.28	16.39 **
8	(548) West Palm Beach, FL	145.33	1.50	1404.49	8.96 **	1085.38	7.39 **	1037.94	7.18 **	868.26	6.66 **
17	(549) Dallas, TX	611.38	7.94 **	1903.41	12.25 **	1760.52	12.09 **	1767.28	12.34 **	1088.65	8.43 **
11	(550) Danville, IL	115.95	1.02	192.89	1.18	26.52	0.17	89.99	0.60	-57.69	-0.42
10	(552) Dayton, OH	1456.43	13.24 **	2906.31	17.73 **	2338.49	15.22 **	2229.21	14.75 **	1898.73	13.93 **
11	(553) Detroit, MI	1420.20	14.23 **	2427.87	15.01 **	1975.77	13.03 **	1923.01	12.89 **	1849.53	13.74 **
19	(554) Denver, CO	1422.95	13.60 **	2841.91	17.25 **	2525.27	16.36 **	2462.12	16.21 **	564.71	4.12 **
14	(555) Des Moines, IA	-1345.48	-8.53 **	-59.34	-0.33	107.83	0.63	105.86	0.63	-235.71	-1.56
12	(556) North Chicago, IL	1716.55	12.53 **	2464.86	14.37 **	1996.23	12.42 **	1984.89	12.55 **	1980.45	13.88 **
7	(557) Dublin, GA	-412.47	-3.27 **	1091.74	6.39 **	733.47	4.58 **	744.85	4.73 **	403.55	2.84 **
6	(558) Durham, NC	1865.10	17.82 **	2520.41	15.39 **	1976.71	12.88 **	1808.43	11.97 **	1352.21	9.93 **
3	(561) East Orange, NJ	1800.43	20.39 **	2874.61	18.54 **	2671.51	18.39 **	2628.82	18.39 **	2411.60	18.70 **
4	(562) Erie, PA	84.36	0.61	1345.93	7.66 **	1300.83	7.90 **	1236.51	7.63 **	1016.27	6.95 **
16	(564) Fayetteville, AR	-408.33	-3.49 **	375.22	2.26 *	533.37	3.43 **	485.15	3.17 **	387.44	2.81 **
6	(565) Fayetteville, NC	-701.77	-6.64 **	790.48	4.76 **	663.80	4.26 **	611.36	3.99 **	494.17	3.58 **
19	(567) Fort Lyon, CO	829.32	5.42 **	2205.89	11.70 **	2015.84	11.41 **	1949.65	11.21 **	2047.42	13.06 **
13	(568) Black Hills-Fort Meade, SD	1228.39	9.10 **	1884.99	11.11 **	1477.44	9.29 **	1438.24	9.19 **	686.02	4.86 **
21	(570) Fresno, CA	738.06	6.26 **	2303.69	13.38 **	2046.12	12.68 **	2014.58	12.69 **	1461.30	10.21 **
8	(573) Gainesville, FL	210.56	2.77 **	1312.28	8.61 **	1012.35	7.08 **	996.17	7.09 **	465.66	3.67 **
19	(575) Grand Junction, CO	581.25	3.36 **	974.29	4.98 **	878.42	4.79 **	775.15	4.29 **	406.06	2.49 *

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Table D.8—continued

		Base Case		VERA-3		VERA-10		VERA-47		VA DCGs	
	R-Squared	0.25		0.30		0.38		0.40		0.51	
Variable Category		Estimate	t-Statistic	Estimate	t-Statistic	Estimate	t-Statistic	Estimate	t-Statistic	Estimate	t-Statistic
VISN	(Code) Facility Location										
12	(578) Hines, IL	2454.93	24.77 **	2744.52	17.22 **	2368.33	15.85 **	2315.54	15.76 **	1715.38	12.94 **
16	(580) Houston, TX	1289.98	15.89 **	1864.12	11.90 **	1836.00	12.51 **	1792.42	12.41 **	1595.74	12.25 **
9	(581) Huntington, WV	86.99	0.79	453.10	2.76 **	587.88	3.82 **	516.28	3.41 **	290.61	2.13 *
11	(583) Indianapolis, IN	1474.90	14.97 **	1502.24	9.48 **	1376.16	9.27 **	1297.35	8.88 **	466.70	3.54 **
14	(584) Iowa City, IA	993.50	8.79 **	1861.86	11.42 **	1774.54	11.61 **	1697.47	11.29 **	718.08	5.30 **
12	(585) Iron Mountain, MI	-304.63	-1.97 *	535.29	2.93 **	393.13	2.29 *	356.84	2.12 *	333.40	2.19 *
16	(586) Jackson, MS	816.37	8.35 **	781.12	4.84 **	604.68	4.00 **	604.13	4.06 **	286.86	2.14 *
15	(589) Kansas City, MO	1188.10	11.13 **	2469.73	15.22 **	2118.69	13.93 **	2035.51	13.61 **	631.07	4.68 **
6	(590) Hampton, VA	559.84	4.95 **	1113.12	6.58 **	983.44	6.20 **	929.79	5.96 **	423.48	3.01 **
22	(593) Las Vegas, NV	-135.64	-1.33	1605.39	9.66 **	1520.50	9.76 **	1516.35	9.89 **	1277.72	9.24 **
4	(595) Lebanon, PA	371.82	3.33 **	2000.61	12.04 **	1671.83	10.73 **	1557.19	10.16 **	1341.78	9.70 **
9	(596) Lexington, Leestown, KY	1666.59	15.52 **	1902.82	11.64 **	1525.99	9.96 **	1534.98	10.19 **	922.76	6.79 **
14	(597) Lincoln, NE	-1369.63	-7.87 **	730.47	3.94 **	755.70	4.35 **	747.52	4.37 **	569.67	3.69 **
16	(598) Little Rock, AR	2013.05	22.89 **	2023.87	12.88 **	1899.63	12.90 **	1820.51	12.56 **	1336.70	10.23 **
22	(600) Long Beach, CA	2179.84	22.59 **	3517.38	21.74 **	3048.00	20.10 **	3067.01	20.56 **	2300.68	17.10 **
9	(603) Louisville, KY	613.92	6.03 **	1377.60	8.71 **	1193.07	8.05 **	1129.50	7.75 **	956.83	7.27 **
22	(605) Loma Linda, CA	855.41	9.05 **	2307.44	14.24 **	1945.42	12.81 **	1925.62	12.89 **	1551.18	11.51 **
12	(607) Madison, WI	1999.59	16.03 **	2881.16	17.16 **	2334.94	14.84 **	2282.21	14.74 **	293.89	2.10 *
1	(608) Manchester, NH	193.88	1.40	1420.52	8.08 **	939.23	5.70 **	865.24	5.34 **	1018.83	6.97 **
15	(609) Marion, IL	-730.99	-7.14 **	365.48	2.27 *	462.19	3.06 **	415.92	2.80 **	-232.01	-1.73
11	(610) NIHCS-Marion, IN	1399.92	10.95 **	1901.29	11.14 **	1701.82	10.64 **	1609.54	10.23 **	1745.62	12.30 **
21	(612) NCHCS/Martinez, CA	-388.90	-4.49 **	749.37	4.71 **	638.03	4.28 **	584.52	3.98 **	296.21	2.24 *
5	(613) Martinsburg, WV	988.94	8.59 **	1586.98	9.60 **	1406.25	9.08 **	1347.05	8.84 **	803.34	5.84 **
9	(614) Memphis, TN	1298.55	13.48 **	1554.52	9.89 **	1515.76	10.29 **	1521.37	10.50 **	878.70	6.72 **
13	(618) Minneapolis, MN	1986.26	22.60 **	3190.13	20.71 **	2780.90	19.27 **	2684.75	18.90 **	1090.88	8.52 **
7	(619) CAVHCS- Montgomery, AL	1063.40	10.51 **	2490.75	15.29 **	2345.79	15.37 **	2366.24	15.76 **	2232.42	16.48 **
3	(620) Montrose, NY	2084.24	17.73 **	3144.93	19.33 **	3119.30	20.46 **	3058.49	20.38 **	2586.90	19.12 **
9	(621) Mountain Home, TN	888.24	8.01 **	1663.14	10.13 **	1309.63	8.51 **	1169.57	7.73 **	175.87	1.29
9	(622) Murfreesboro, TN	355.24	3.21 **	1120.99	6.80 **	803.52	5.20 **	744.54	4.90 **	581.15	4.24 **
16	(623) Muskogee, OK	-143.64	-1.31	904.22	5.34 **	1158.26	7.30 **	1122.62	7.19 **	806.60	5.73 **
9	(626) Nashville, TN	1095.97	11.48 **	1775.12	11.16 **	1521.25	10.20 **	1433.83	9.77 **	851.44	6.43 **
16	(629) New Orleans, LA	1561.71	15.99 **	2238.00	13.91 **	2007.20	13.31 **	2010.49	13.55 **	1834.95	13.72 **
3	(630) New York, NY	3272.00	31.92 **	4557.47	28.57 **	4143.99	27.72 **	4054.46	27.57 **	3169.15	23.89 **
1	(631) Northampton, MA	196.23	1.25	1643.31	8.86 **	1641.58	9.44 **	1586.10	9.27 **	1120.79	7.26 **
3	(632) Northport, NY	2394.31	22.46 **	3456.64	21.75 **	3053.97	20.50 **	3009.73	20.54 **	2348.86	17.77 **
16	(635) Oklahoma City, OK	307.24	3.44 **	837.18	5.22 **	900.14	5.99 **	834.00	5.64 **	454.27	3.41 **
14	(636) Omaha, NE	2704.31	24.71 **	2628.60	16.23 **	2232.47	14.71 **	2057.92	13.78 **	934.48	6.94 **
6	(637) Asheville, NC	1457.98	11.94 **	1270.67	7.44 **	1183.72	7.40 **	1081.89	6.87 **	802.14	5.65 **
21	(640) Palo Alto, CA	3496.90	37.04 **	4125.26	25.88 **	3701.75	24.78 **	3721.54	25.32 **	3353.66	25.29 **

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Table D.8—continued

		Base Case		VERA-3		VERA-10		VERA-47		VA DCGs	
	R-Squared	0.25		0.30		0.38		0.40		0.51	
Variable Category		Estimate	t-Statistic	Estimate	t-Statistic	Estimate	t-Statistic	Estimate	t-Statistic	Estimate	t-Statistic
VISN											
4	(642) Philadelphia, PA	845.47	9.06 **	2463.54	15.76 **	2068.05	14.12 **	2033.62	14.11 **	1899.58	14.61 **
18	(644) Phoenix, AZ	766.53	8.49 **	1903.58	11.86 **	1803.47	11.99 **	1770.64	11.97 **	880.98	6.60 **
4	(646) Pittsburgh-University Drive, PA	2469.00	26.94 **	3396.26	21.60 **	2608.43	17.70 **	2525.33	17.42 **	1971.39	15.08 **
15	(647) VAMC Poplar Bluff, MO	-580.60	-4.11 **	315.48	1.76	398.45	2.38 *	403.25	2.44 *	218.35	1.47
20	(648) Portland, OR	2262.44	23.88 **	3453.27	21.35 **	2943.07	19.41 **	2949.83	19.78 **	1732.29	12.87 **
18	(649) Prescott, AZ	-93.60	-0.62	876.70	4.73 **	516.99	2.97 **	404.18	2.36 *	473.28	3.07 **
1	(650) Providence, RI	278.42	2.40 *	2415.89	14.39 **	1977.05	12.56 **	1894.79	12.24 **	925.82	6.63 **
6	(652) Richmond, VA	2250.84	22.00 **	2169.18	13.44 **	1855.75	12.27 **	1852.38	12.44 **	1052.79	7.84 **
20	(653) Roseburg, OR	457.12	3.57 **	1490.37	8.47 **	1311.68	7.96 **	1304.41	8.04 **	1130.92	7.73 **
21	(654) Reno, NV	310.50	2.59 **	1574.64	9.19 **	1386.59	8.63 **	1341.78	8.49 **	754.92	5.30 **
11	(655) Saginaw, MI	67.93	0.52	1803.81	10.36 **	1420.62	8.71 **	1362.21	8.49 **	1145.75	7.91 **
13	(656) St. Cloud, MN	225.08	1.47	1772.76	9.96 **	1016.82	6.10 **	841.13	5.13 **	737.04	4.98 **
15	(657) St Louis, John Cochrane, MO	1169.41	12.41 **	2208.05	13.91 **	1791.42	12.04 **	1726.72	11.80 **	1136.09	8.60 **
6	(658) Salem, VA	1090.72	10.05 **	1473.47	8.89 **	1034.97	6.66 **	1028.60	6.73 **	649.89	4.72 **
6	(659) Salisbury, NC	109.19	1.08	1631.11	10.04 **	1523.36	10.01 **	1368.89	9.14 **	1447.60	10.72 **
19	(660) Salt Lake City, UT	1685.66	16.05 **	2197.05	13.47 **	2095.33	13.71 **	2013.41	13.39 **	1032.45	7.61 **
21	(662) San Francisco, CA	3062.03	28.93 **	3866.75	23.36 **	3587.29	23.12 **	3594.23	23.55 **	3001.50	21.80 **
20	(663) Seattle, WA	1007.39	12.33 **	2337.06	14.47 **	2200.90	14.54 **	2136.66	14.35 **	1449.34	10.79 **
22	(664) San Diego, CA	1562.06	17.14 **	3679.81	22.82 **	3460.15	22.89 **	3421.51	23.01 **	2910.09	21.70 **
19	(666) Sheridan, WY	1380.55	6.70 **	1238.31	5.95 **	1103.68	5.66 **	1059.74	5.53 **	798.55	4.62 **
16	(667) Shreveport, LA	517.50	5.16 **	1234.45	7.77 **	1222.36	8.21 **	1213.08	8.28 **	717.22	5.43 **
20	(668) Spokane, WA	13.40	0.11	1717.35	9.81 **	1448.59	8.83 **	1411.86	8.75 **	724.61	4.98 **
2	(670) VAMC Syracuse, NY	-3057.84	-16.06 **	601.63	3.03 **	873.76	4.69 **	800.06	4.37 **	455.32	2.75 **
17	(671) San Antonio, TX	932.85	11.48 **	1766.55	11.40 **	1477.66	10.18 **	1456.85	10.20 **	1173.46	9.11 **
8	(673) Tampa, FL	183.27	2.42 *	1441.31	9.49 **	1241.08	8.72 **	1250.02	8.93 **	604.16	4.78 **
17	(674) Temple, TX	729.66	8.62 **	1662.41	10.52 **	1481.34	10.00 **	1375.46	9.44 **	1060.65	8.07 **
12	(676) Tomah, WI	1398.41	8.36 **	2647.19	15.17 **	2294.22	14.03 **	2163.60	13.45 **	1855.01	12.78 **
15	(677) VAMC Topeka, KS	1213.06	10.90 **	2103.74	13.06 **	1801.07	11.93 **	1697.20	11.43 **	716.24	5.35 **
18	(678) Tucson, AZ	536.42	5.36 **	818.06	5.03 **	772.62	5.07 **	722.55	4.82 **	-93.03	-0.69
7	(679) Tuscaloosa, AL	1320.44	8.58 **	1898.15	10.29 **	1377.10	7.97 **	1405.65	8.27 **	1316.78	8.59 **
20	(687) Walla Walla, WA	-337.08	-2.16 *	628.54	3.28 **	662.25	3.68 **	567.94	3.21 **	997.71	6.26 **
5	(688) Washington, DC	1451.31	15.33 **	2845.82	18.04 **	2572.69	17.40 **	2567.31	17.65 **	2138.28	16.30 **

RAND*MR1629-TD.8i*

Table D.8—continued

		Base Case		VERA-3		VERA-10		VERA-47		VA DCGs	
	R-Squared	0.25		0.30		0.38		0.40		0.51	
Variable Category		Estimate	t-Statistic	Estimate	t-Statistic	Estimate	t-Statistic	Estimate	t-Statistic	Estimate	t-Statistic
VISN	(Code) Facility Location										
1	(689) VACHS, West Haven, CT	1583.86	16.73 **	3053.61	19.49 **	2605.19	17.74 **	2570.11	17.79 **	2268.19	17.40 **
22	(691) West Los Angeles, CA	2287.25	29.35 **	3945.61	25.30 **	3413.07	23.35 **	3432.04	23.87 **	2909.00	22.43 **
20	(692) White City, OR	-3213.22	-16.90 **	-1455.36	-6.89 **	-1242.19	-6.27 **	-1451.65	-7.43 **	-1862.37	-10.60 **
4	(693) Wilkes-Barre, PA	606.19	6.05 **	2069.32	12.85 **	1794.69	11.89 **	1750.07	11.79 **	1297.20	9.69 **
12	(695) Milwaukee, WI	1651.13	16.37 **	2677.49	16.84 **	2348.18	15.76 **	2264.66	15.45 **	1611.12	12.19 **
18	(756) El Paso, TX	-675.41	-5.64 **	1047.59	6.01 **	1238.10	7.58 **	1122.86	6.99 **	981.13	6.77 **
10	(757) Columbus IOC, OH	-925.35	-7.55 **	1886.77	11.06 **	1825.43	11.41 **	1779.98	11.31 **	1064.29	7.50 **
8	(672) San Juan, PR	Reference		Reference		Reference		Reference		Reference	

RAND*MR1629-TD.8j*

* Indicates statistical significance at 95% confidence level.

** Indicates statistical significance at 99% confidence level.

NOTE: The data on physicians per capita and hospital beds per capita from the ARF data were missing for the same group of individuals. As a result, only one missing category can be estimated between the two variables. That estimate is reported in the row labeled ARF Variables Missing.

Table D.9

Facility-Level Regression Results for the Fully Specified Model (Including Basic Care Priority 7s)

	Base Case		VERA-3		VERA-10		VERA-47		VA DCGs	
R-Squared	**0.35**		**0.60**		**0.61**		**0.62**		**0.60**	
Variable	**Estimate**	**t-Statistic**	**Estimate**	**t-Statistic**	**Estimate**	**t-Statistic**	**Estimate**	**t-Statistic**	**Estimate**	**t-Statistic**
Intercept	-2597.02	-1.16	-6231.92	-3.01 **	-5585.89	-3.16 **	-5588.58	-3.24 **	-5521.05	-3.33 **
Rural/Urban Status										
Urban			-204.58	-0.35	-313.52	-0.63	-317.89	-0.66	-675.32	-1.45
Suburban			-576.92	-0.98	-584.33	-1.16	-575.44	-1.17	-981.56	-2.08 *
Rural			-668.94	-1.01	-549.91	-0.97	-559.44	-1.01	-888.05	-1.68
Very Rural			Reference		Reference		Reference		Reference	
Residents per Full-time MD	500.63	2.43 *	-46.73	-0.22	-73.54	-0.40	-87.14	-0.49	-478.70	-2.79 **
VA Labor Index	2729.02	1.22	5869.13	2.95 **	5794.11	3.41 **	5776.64	3.47 **	5972.63	3.74 **
Average Food Cost per Bed Day			10.52	0.50	6.64	0.37	6.42	0.36	6.90	0.41
Energy Price (dollars per million BTUs)			9.10	0.17	-5.03	-0.11	-4.59	-0.10	27.84	0.65
Contract Labor Costs			-938.71	-0.35	-700.91	-0.31	-500.06	-0.22	-2115.77	-0.99
Square Feet of Building Space per Acre of Land			5.70	2.02 *	6.21	2.58 *	6.02	2.56 *	6.66	2.94 **
Square Feet of Building Space per Unique Patient			-11.06	-1.99 *	-12.59	-2.65 **	-12.85	-2.77 **	-11.19	-2.51 *
Research Costs per 1000 Unique Patients	0.006	5.17 **	0.004	2.48 *	0.003	2.10 *	0.003	2.26 *	0.003	2.21 *
Percent of Funded Research			-2117.18	-0.16	2330.58	0.21	1509.72	0.14	8500.36	0.80
Average Building Age as of 2001			-2.42	-0.38	-1.16	-0.21	-1.34	-0.25	-0.73	-0.14
Average Building Condition (scale of 1-5)			42.96	0.33	40.16	0.37	36.75	0.34	-3.69	-0.04
Leased Square Feet per Patient			105.31	1.92	115.89	2.48 *	113.35	2.48 *	109.59	2.50 *
Ratio of Historic to Total Number of Buildings			35.56	0.10	81.69	0.27	83.48	0.28	269.44	0.94
Total Number of Buildings			3.71	1.06	3.82	1.28	3.57	1.22	0.77	0.28
Indicator for Recent Facility/Management Consolidation			-156.90	-0.69	-90.65	-0.47	-78.68	-0.42	-73.62	-0.41

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Table D.9—continued

	Base Case		VERA-3		VERA-10		VERA-47		VA DCGs	
R-Squared	0.35		0.60		0.61		0.62		0.60	
Variable	Estimate	t-Statistic	Estimate	t-Statistic	Estimate	t-Statistic	Estimate	t-Statistic	Estimate	t-Statistic
Occupancy Rate			270.87	0.57	-3.06	-0.01	-23.59	-0.06	-138.18	-0.37
Number of CBOCs per 1000 Unique Patients			1133.80	2.38 *	712.12	1.75	677.36	1.70	355.93	0.93
Direct Patient Care FTEs per 1000 Unique Patients			67.03	1.42	62.27	1.54	59.92	1.52	-7.75	-0.20
Non-patient Care FTEs per 1000 Unique Patients			41.08	2.66 **	33.23	2.52 *	34.99	2.72 **	52.45	4.25 **
LTC Beds per 1000 Unique Patients			-20.00	-2.08 *	-16.44	-2.00 *	-18.25	-2.27 *	-22.61	-2.94 **
Special Program Beds per 1000 Unique Patients			-96.39	-0.86	-30.44	-0.32	-22.18	-0.24	-29.15	-0.32

* Indicates statistical significance at 95% confidence level.

** Indicates statistical significance at 99% confidence level.

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Table D.10

Comparison of FY 2002 Actual Allocations with Simulated Allocations (in $1,000) for the Fully Specified Model (Including Basic Care Priority 7s)

VISN	FY02 Allocations	VERA -3	Diff from FY02	VERA-10	Diff from FY02	VERA-47	Diff from FY02	VA DCGs	Diff from FY02
01 Boston	909,715	898,672	-1.2%	907,322	-0.3%	912,955	0.4%	927,313	1.9%
02 Albany	497,198	535,626	7.7%	521,099	4.8%	521,995	5.0%	518,128	4.2%
03 Bronx	1,037,301	946,173	-8.8%	954,049	-8.0%	956,018	-7.8%	967,719	-6.7%
04 Pittsburgh	936,020	810,011	-13.5%	851,653	-9.0%	853,573	-8.8%	829,311	-11.4%
05 Baltimore	564,929	585,003	3.6%	574,585	1.7%	575,045	1.8%	559,369	-1.0%
06 Durham	861,286	866,945	0.7%	878,069	1.9%	883,170	2.5%	880,808	2.3%
07 Atlanta	1,050,304	1,063,835	1.3%	1,042,535	-0.7%	1,034,651	-1.5%	1,031,004	-1.8%
08 Bay Pines	1,437,387	1,541,184	7.2%	1,541,356	7.2%	1,530,861	6.5%	1,508,476	4.9%
09 Nashville	831,591	913,908	9.9%	903,045	8.6%	904,877	8.8%	890,063	7.0%
10 Cincinnati	682,951	593,982	-13.0%	613,782	-10.1%	618,911	-9.4%	639,682	-6.3%
11 Ann Arbor	750,330	815,861	8.7%	824,749	9.9%	824,718	9.9%	801,018	6.8%
12 Chicago	883,268	920,482	4.2%	935,300	5.9%	935,150	5.9%	925,934	4.8%
13 Minneapolis	508,738	463,231	-8.9%	482,772	-5.1%	485,397	-4.6%	545,604	7.2%
14 Lincoln	348,050	316,181	-9.2%	315,019	-9.5%	317,874	-8.7%	338,905	-2.6%
15 Kansas City	703,102	697,211	-0.8%	689,138	-2.0%	691,853	-1.6%	717,722	2.1%
16 Jackson	1,466,801	1,617,187	10.3%	1,562,531	6.5%	1,557,815	6.2%	1,499,353	2.2%
17 Dallas	832,097	844,298	1.5%	846,076	1.7%	844,196	1.5%	822,254	-1.2%
18 Phoenix	715,290	709,652	-0.8%	703,949	-1.6%	705,900	-1.3%	702,356	-1.8%
19 Denver	473,985	455,107	-4.0%	451,449	-4.8%	452,219	-4.6%	476,537	0.5%
20 Portland	824,844	738,802	-10.4%	743,702	-9.8%	744,885	-9.7%	800,568	-2.9%
21 San Francisco	931,506	990,886	6.4%	966,236	3.7%	963,779	3.5%	953,416	2.4%
22 Long Beach	1,062,308	984,764	-7.3%	1,000,587	-5.8%	993,160	-6.5%	973,460	-8.4%
23 Lincoln & Minneapolis	856,788	779,412	-9.0%	797,791	-6.9%	803,271	-6.2%	884,509	3.2%

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Table D.11

Comparison of Patient-Level Regression Results for the Policy Model—ARC, HERC, DSS (Excluding Basic Care Priority 7s)

		VERA 3						VA DCGs					
		ARC		HERC		DSS		ARC		HERC		DSS	
	R-Squared	0.26		0.23		0.24		0.50		0.45		0.44	
Variable Category		**Estimate**	**t-Statistic**	**Estimate**	**t-Statistic**	**Estimate**	**t-Statistic**	**Estimate**	**t-Statistic**	**Estimate**	**t-Statistic**	**Estimate**	**t-Statistic**
Intercept		-740.82	-2.69 **	-673.79	-2.21 *	-651.60	-2.25 *	166035.87	145.51 **	174213.13	137.75 **	175940.95	141.08 **
Age	Missing	-1550.58	-20.80 **	-1752.82	-21.14 **	-1683.99	-21.30 **	381.12	6.16 **	72.52	1.03	206.46	3.04 **
	Less than 2	-2734.58	-29.93 **	-2820.64	-28.18 **	-2748.15	-28.28 **	-55.02	-0.73	-107.52	-1.27	-127.17	-1.53
	25-34	-2616.42	-42.58 **	-2849.92	-42.46 **	-2693.91	-41.34 **	-36.96	-0.73	-227.71	-4.01 **	-182.08	-3.26 **
	35-44	-2037.65	-35.98 **	-2357.95	-38.13 **	-2201.52	-36.67 **	143.73	3.06 **	-126.07	-2.41 *	-76.62	-1.49
	45-54	-1268.59	-23.51 **	-1545.33	-26.23 **	-1412.58	-24.69 **	426.35	9.54 **	193.96	3.90 **	234.68	4.79 **
	55-64	-487.20	-8.93 **	-663.02	-11.14 **	-559.15	-9.67 **	644.12	14.27 **	501.02	9.97 **	532.99	10.78 **
	65-74	-916.68	-17.43 **	-968.84	-16.87 **	-967.34	-17.35 **	241.28	5.54 **	217.33	4.48 **	141.67	2.97 **
	75-84	-556.97	-10.53 **	-574.79	-9.96 **	-551.43	-9.84 **	109.97	2.51 *	116.37	2.39 *	86.07	1.79
	85 and over	Reference		Reference		Reference		Reference		Reference		Reference	
Sex	Missing	-57.92	-0.15	-321.86	-0.76	100.40	0.25	-18.20	-0.06	-319.08	-0.89	95.57	0.28
	Female	313.13	9.35 **	293.70	8.05 **	606.63	17.13 **	318.37	11.48 **	291.00	9.45 **	592.32	19.55 **
	Male	Reference		Reference		Reference		Reference		Reference		Reference	
Number of MDs per Capita	Less than 0.001	-220.32	-7.24 **	-172.62	-5.20 **	-182.64	-5.66 *	53.01	-2.10 *	-7.24	-0.26	-27.09	-0.98
	0.001 to 0.002	-270.92	-10.32 **	-248.50	-8.68 **	-261.96	-9.42 *	61.20	-2.81 **	-36.13	-1.49	-61.98	-2.61 **
	0.0021 to 0.003	-264.59	-10.47 **	-186.23	-6.72 **	-234.37	-8.71 *	81.42	-3.89 **	-3.83	-0.16	-59.24	-2.57 **
	Greater than 0.003	Reference		Reference		Reference		Reference		Reference		Reference	
Hospital Beds per Capita	Less than 0.003	-188.26	-6.93 **	-242.05	-8.17 **	-127.72	-4.44 **	-72.26	-3.21 **	-123.38	-4.93 **	-15.47	-0.63
	0.003 to 0.006	-108.14	-4.45 **	-140.07	-5.29 **	-66.95	-2.60 **	-3.20	-0.16	-35.42	-1.58	32.75	1.49
	Greater than 0.006	Reference		Reference		Reference		Reference		Reference		Reference	
ARF Variables Missing		282.66	1.13	-265.12	-0.97	411.50	1.57	442.49	2.14 *	-81.90	-0.36	552.73	2.46 *
Rural/UrbanStatus	Missing	1160.91	4.06 **	1967.05	6.32 **	1484.59	4.93 **	466.21	1.97 *	1260.68	4.80 **	851.87	3.31 **
	Urban	75.71	1.81	39.41	0.86	129.75	2.93 **	2.05	0.06	-22.85	-0.59	69.72	1.84
	Suburban	87.63	2.14 *	49.77	1.11	103.06	2.38 *	23.25	0.69	-6.76	-0.18	47.14	1.27
	Rural	-48.03	-1.06	-20.42	-0.41	32.61	0.68	-50.43	-1.35	-18.90	-0.45	30.80	0.75
	Very Rural	Reference		Reference		Reference		Reference		Reference		Reference	
Distance to Closest Facility	Missing	-1130.76	-8.98 **	-644.74	-4.13 **	-553.68	-3.74 **	-912.47	-8.75 **	-685.01	-5.20 **	-571.39	-4.50 **
	Less than 30 miles	240.51	2.11 *	519.57	4.10 **	346.87	2.90 **	-558.96	-5.92 **	-304.73	-2.85 **	-448.55	-4.38 **
	31 to 100 mile	-370.07	-3.25 **	-130.03	-1.03	-242.09	-2.03 *	-652.47	-6.93 **	-435.35	-4.08 **	-541.91	-5.30 **
	101 to 250 mile	-586.48	-5.09 **	-388.62	-3.03 **	-457.28	-3.78 **	-548.83	-5.75 **	-376.00	-3.48 **	-448.83	-4.33 **
	Greater than 250 miles	Reference		Reference		Reference		Reference		Reference		Reference	
Distance to Closest CBOC	Missing	356.66	1.65	-311.63	-1.26	237.32	1.01	-230.93	-1.29	-738.18	-3.52 **	-157.71	-0.78
	Less than 30 mile	-585.71	-3.67 **	-639.74	-3.64 **	-510.25	-3.04 **	-384.87	-2.91 **	-421.90	-2.85 **	-321.56	-2.24 *
	31 to 100 mile	-440.33	-2.76 **	-421.99	-2.41 *	-341.00	-2.03 *	-343.53	-2.60 **	-316.20	-2.14 *	-254.00	-1.77
	Greater than 100 miles	Reference		Reference		Reference		Reference		Reference		Reference	

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Table D.11—continued

		VERA 3						VA DCGs					
		ARC		HERC		DSS		ARC		HERC		DSS	
	R-Squared	0.26		0.23		0.24		0.50		0.45		0.44	
Variable Category		**Estimate**	**t-Statistic**	**Estimate**	**t-Statistic**	**Estimate**	**t-Statistic**	**Estimate**	**t-Statistic**	**Estimate**	**t-Statistic**	**Estimate**	**t-Statistic**
Medicare Reliance	Missing	2780.38	94.79 **	2813.85	87. **	2647.01	85.16 **	1220.68	50.31 **	1242.66	45.86 **	1137.45	42.80 **
	None	5445.71	172.99 **	5459.92	158.69 **	5361.75	160.79 **	2538.92	96.18 **	2557.18	86.93 **	2574.99	89.11 **
	1 to 24%	7697.43	221.82 **	7346.67	194.21 **	7273.47	198.19 **	3240.57	110.83 **	2871.87	88.38 **	2984.43	93.40 **
	25 to 49%	3322.26	80.77 **	3265.65	72.85 **	3261.90	74.97 **	931.30	27.19 **	885.81	23.28 **	978.30	26.13 **
	50 to 75%	1759.20	46.62 **	1747.93	42.49 **	1849.24	46.33 **	359.57	11.45 **	368.05	10.55 **	498.30	14.52 **
	75 to 100%	Reference		Reference		Reference		Reference		Reference		Reference	
Medicare Imputation Indicator		2384.13	67.55 **	2381.95	61.95 **	2301.58	61.63 **	1204.24	41.16 **	1209.17	37.20 **	1166.28	36.46 **
Medicaid LTC	Missing	-1682.71	-5.28 **	-2686.13	-7.71 **	-2080.64	-6.21 **	-619.24	-2.35 *	-1576.47	-5.36 **	-1046.39	-3.65 **
	First Quartile (lowest)	-103.16	-1.34	-234.44	-2.81 **	-22.06	-0.27	-91.42	-1.44	-233.01	-3.31 **	-9.03	-0.13
	Second Quartile	-55.98	-0.83	-233.77	-3.17 **	-38.59	-0.54	-76.20	-1.36	-267.15	-4.29 **	-57.85	-0.95
	Third Quartile	167.80	2.98 **	-31.81	-0.52	123.85	2.08 *	94.02	2.01 *	-113.06	-2.18 *	49.5	.97
	Fourth Quartile (highest)	Reference		Reference		Reference		Reference		Reference		Reference	
VERA 3 Patient Groups	Basic Care	2110.33	71.66 **	2151.32	66.60 **	2060.36	65.79 **						
	Complex Care	31410.08	685.54 **	31231.80	624.24 **	30666.94	632.42 **						
	Non-Vested	Reference		Reference		Reference							
VA DCG Patient Groups	**Code**												
	Missing							-167083.56	-148.86 **	-175127.64	-140.87 **	-177013.83	-144.28 **
	DCG 0.1							-166572.12	-148.96 **	-174633.69	-141.00 **	-176399.69	-144.31 **
	DCG 0.2							-166162.40	-148.57 **	-174265.44	-140.68 **	-176002.40	-143.97 **
	DCG 0.3							-165932.89	-148.32 **	-174008.38	-140.43 **	-175697.92	-143.67 **
	DCG 0.4							-165841.55	-148.18 **	-173942.87	-140.32 **	-175658.68	-143.58 **
	DCG 0.5							-165721.84	-148.16 **	-173824.27	-140.31 **	-175512.58	-143.54 **
	DCG 0.7							-165547.54	-148.02 **	-173681.61	-140.21 **	-175380.67	-143.46 **
	DCG 1							-165088.29	-147.61 **	-173223.76	-139.84 **	-174873.75	-143.04 **
	DCG 1.5							-164631.60	-147.19 **	-172753.34	-139.45 **	-174372.63	-142.62 **
	DCG 2							-164525.84	-147.08 **	-172693.41	-139.39 **	-174377.96	-142.61 **
	DCG 2.5							-163915.64	-146.55 **	-172115.89	-138.94 **	-173748.71	-142.11 **
	DCG 3							-163149.87	-145.87 **	-171387.08	-138.35 **	-172987.25	-141.49 **
	DCG 4							-162346.24	-145.13 **	-170621.82	-137.71 **	-172210.34	-140.83 **
	DCG 5							-161044.88	-143.98 **	-169278.72	-136.64 **	-170936.06	-139.80 **
	DCG 6							-158577.65	-141.77 **	-166854.15	-134.68 **	-168665.69	-137.94 **
	DCG 7.5							-153062.30	-136.83 **	-161254.95	-130.15 **	-163553.57	-133.75 **
	DCG 10							-139899.60	-125.05 **	-148007.69	-119.45 **	-151446.66	-123.84 **
	DCG 15							-121867.37	-108.83 **	-130980.79	-105.61 **	-132909.01	-108.58 **
	DCG 20							-115077.74	-102.58 **	-123304.12	-99.24 **	-126624.26	-103.26 **
	DCG 25							-104913.32	-93.23 **	-111874.81	-89.76 **	-115749.43	-94.10 **
	DCG 30							-89310.96	-79.24 **	-95714.85	-76.68 **	-100558.77	-81.62 **
	DCG 40							-63737.52	-55.76 **	-64466.21	-50.93 **	-75133.26	-60.15 **
	DCG 50							-38736.34	-32.46 **	-45773.52	-34.66 **	-47444.09	-36.40 **
	DCG 60							-21077.20	-16.20 **	-18147.97	-12.61 **	-31201.77	-21.97 **
	DCG 70							Reference		Reference		Reference	

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Table D.11—continued

		VERA 3						VA DCGs					
		ARC		HERC		DSS		ARC		HERC		DSS	
	R-Squared	0.26		0.23		0.24		0.50		0.45		0.44	
Variable Category		Estimate	t-Statistic	Estimate	t-Statistic	Estimate	t-Statistic	Estimate	t-Statistic	Estimate	t-Statistic	Estimate	t-Statistic
VISN	(Code) Facility Location												
21	(358) VARO&OPC Manila, PI	-1390.47	-5.39 **	-1316.86	-4.62 **	-1729.10	-6.37 **	-211.17	-0.99	-51.60	-0.21	-558.41	-2.40 *
1	(402) Togus, ME	230.04	1.15	389.54	1.77	-144.19	-0.69	762.61	4.62 **	952.56	5.11 **	398.60	2.21 *
1	(405) White River Junction, VT	-106.33	-0.52	-395.50	-1.74	-147.82	-0.68	473.70	2.78 **	219.41	1.14	447.07	2.41 *
19	(436) Fort Harrison, MT	-556.32	-2.67 **	-778.85	-3.37 **	-699.68	-3.18 **	14.11	0.08	-186.91	-0.96	-121.08	-0.64
13	(437) Fargo, ND	-495.43	-2.42 *	-234.01	-1.03	-167.67	-0.78	-211.13	-1.24	56.15	0.29	139.74	0.76
13	(438) Sioux Falls, SD	-413.79	-1.99 *	-514.63	-2.25 *	-438.96	-2.01 *	-952.16	-5.54 **	-1040.35	-5.39 **	-922.40	-4.93 **
19	(442) Cheyenne, WY	-181.68	-0.77	-253.32	-0.98	-135.13	-0.55	709.35	3.65 **	659.32	3.03 **	752.57	3.56 **
15	(452) Wichita, KS	-419.49	-1.99 *	-442.88	-1.90	-544.38	-2.45 *	216.77	1.24	210.04	1.07	96.79	0.51
21	(459) Honolulu, VAMROC, HI	197.45	0.99	-668.39	-3.04 **	54.50	0.26	1173.71	7.11 **	333.84	1.80	1042.55	5.80 **
4	(460) Wilmington, DE	-328.88	-1.59	-344.36	-1.51	-296.07	-1.36	102.97	0.60	101.31	0.53	148.31	0.80
20	(463) Anchorage, AK	1810.30	8.24 **	-1231.08	-5.03 **	1695.62	7.32 **	2354.51	12.94 **	-674.97	-3.27 **	2255.41	11.38 **
2	(500) VAMC Albany, NY	-1215.53	-5.07 **	-1185.93	-4.50 **	-1067.13	-4.22 **	26.24	0.13	31.40	0.14	163.70	0.76
18	(501) Albuquerque, NM	412.39	2.11 *	187.63	0.87	-36.31	-0.18	663.10	4.10 **	478.46	2.63 **	240.42	1.36
16	(502) Alexandria, LA	-75.09	-0.38	-60.44	-0.28	-216.67	-1.03	585.02	3.55 **	640.10	3.45 **	453.88	2.53 *
4	(503) Altoona, PA	-1042.39	-4.91 **	-1074.38	-4.59 **	-1101.32	-4.92 **	210.54	1.20	189.09	0.96	133.29	0.70
18	(504) Amarillo, TX	105.34	0.52	-34.63	-0.15	-63.29	-0.30	335.19	1.99 *	244.04	1.29	181.07	0.99
11	(506) Ann Arbor, MI	1049.71	5.23 **	1462.99	6.61 **	1204.53	5.69 **	1499.18	9.02 **	1920.42	10.27 **	1670.21	9.23 **
7	(508) Atlanta, GA	608.59	3.19 **	761.43	3.61 **	480.28	2.39 *	735.12	4.66 **	911.39	5.12 **	634.76	3.69 **
7	(509) Augusta, GA	1397.67	6.97 **	1562.38	7.06 **	1213.10	5.74 **	1145.58	6.90 **	1342.47	7.18 **	1025.08	5.67 **
5	(512) Baltimore/Loch Raven, MD	831.70	4.29 **	1472.47	6.86 **	1153.79	5.64 **	1309.71	8.16 **	1964.15	10.84 **	1665.97	9.51 **
2	(514) VAMC Bath, NY	-1734.67	-4.74 **	-1807.50	-4.54 **	-1732.38	-4.50 **	60.39	0.20	-30.84	-0.09	36.68	0.11
11	(515) Battle Creek, MI	-56.42	-0.27	77.18	0.34	-395.05	-1.81	1205.75	7.02 **	1362.37	7.06 **	854.34	4.57 **
8	(516) Bay Pines, FL	310.15	1.62	148.65	0.70	347.53	1.72	348.73	2.20 *	216.66	1.21	417.27	2.42 *
6	(517) Beckley, WV	-562.08	-2.49 *	-762.72	-3.08 **	-554.69	-2.33 *	-202.30	-1.08	-354.93	-1.70	-175.38	-0.86
1	(518) Bedford (Nourse) MA	856.18	3.53 **	1489.62	5.59 **	1171.68	4.58 **	1815.05	9.03 **	2484.91	11.05 **	2137.74	9.77 **
18	(519) Big Spring, TX	-181.23	-0.84	-90.60	-0.38	-387.59	-1.70	459.89	2.56 *	575.31	2.86 **	249.36	1.28
16	(520) Biloxi, MS	304.17	1.59	131.20	0.62	101.98	0.51	647.23	4.09 **	496.96	2.78 **	463.95	2.69 **
7	(521) Birmingham, AL	360.67	1.87	111.81	0.52	171.93	0.85	857.92	5.37 **	619.82	3.44 **	681.25	3.92 **
1	(523) Boston (Jamaica Plain), MA	1773.02	9.28 **	1897.13	8.97 **	2109.13	10.47 **	1793.03	11.33 **	1930.19	10.80 **	2165.75	12.56 **
3	(526) Bronx, NY	1215.18	6.00 **	1250.23	5.59 **	1074.65	5.03 **	2001.09	11.94 **	2037.62	10.79 **	1873.92	10.26 **
3	(527) Brooklyn, NY	179.39	0.86	181.99	0.52	9.94	0.03	866.48	5.00 **	1498.82	5.07 **	1293.36	4.47 **
2	(528) Buffalo, NY	227.54	1.17	306.23	1.42	691.80	3.36 **	880.94	5.45 **	886.18	4.86 **	1305.91	7.41 **
4	(529) Butler, PA	-814.55	-3.77 **	-633.12	-2.66 **	-985.15	-4.32 **	434.31	2.43 *	599.76	2.98 **	250.93	1.29
20	(531) Boise, ID	-20.04	-0.10	-22.91	-0.10	123.21	0.56	-830.44	-4.81 **	-797.13	-4.11 **	-627.65	-3.34 **
2	(532) VAMC Canandaigua, NY	938.90	3.11 **	-1684.70	-1.84	-1352.86	-1.52	2554.30	10.22 **	268.86	0.35	563.10	0.74
7	(534) Charleston, SC	273.20	1.39	162.06	0.75	-30.75	-0.15	990.38	6.10 **	900.33	4.93 **	690.96	3.91 **
12	(537) VA Chicago-Westside, IL	8.23	0.04	69.84	0.32	-1008.90	-4.90 **	870.15	5.39 **	936.99	5.14 **	-117.04	-0.66
10	(538) Chillicothe, OH	311.27	1.42	-96.04	-0.40	50.69	0.22	1164.02	6.42 **	767.15	3.77 **	906.41	4.59 **
10	(539) Cincinnati, OH	1428.92	7.10 **	1227.83	5.53 **	1642.36	7.74 **	604.11	3.63 **	397.96	2.12 *	879.50	4.85 **
4	(540) Clarksburg, WV	-258.44	-1.24	-317.64	-1.38	-589.42	-2.68 **	268.34	1.55	259.73	1.34	-53.85	-0.29
10	(541) Cleveland-Wade Park, OH	178.23	0.94	157.07	0.75	220.21	1.10	455.76	2.91 **	440.98	2.49 *	525.73	3.08 **
4	(542) Coatesville, PA	392.01	1.71	657.11	2.61 **	769.37	3.19 **	1452.52	7.65 **	1730.51	8.13 **	1850.77	8.95 **

RAND*MR1629-TD.11c*

Table D.11—continued

		VERA 3						VA DCGs					
		ARC		HERC		DSS		ARC		HERC		DSS	
	R-Squared	0.26		0.23		0.24		0.50		0.45		0.44	
Variable Category		Estimate	t-Statistic	Estimate	t-Statistic	Estimate	t-Statistic	Estimate	t-Statistic	Estimate	t-Statistic	Estimate	t-Statistic
VISN	(Code) Facility Location												
15	(543) Columbia, MO	257.22	1.28	258.49	1.16	186.60	0.88	-6.53	-0.04	34.21	0.18	-29.10	-0.16
7	(544) Columbia, SC	86.75	0.45	115.29	0.54	-67.02	-0.33	696.88	4.33 **	738.43	4.08 **	546.82	3.12 **
8	(546) Miami, FL	986.80	4.87 **	1083.58	4.85 **	775.76	3.63 **	1713.14	10.20 **	1839.02	9.74 **	1512.48	8.27 **
8	(548) West Palm Beach, FL	141.65	0.73	185.73	0.86	134.47	0.65	470.29	2.91 **	548.94	3.02 **	477.60	2.72 **
17	(549) Dallas, TX	666.56	3.48 **	726.43	3.43 **	571.86	2.83 **	702.56	4.44 **	715.97	4.00 **	587.78	3.40 **
11	(550) Danville, IL	-470.81	-2.34 *	-553.07	-2.49 **	-480.19	-2.26 *	-129.82	-0.78	-179.27	-0.95	-120.70	-0.66
10	(552) Dayton, OH	623.60	3.11 **	840.47	3.80 **	1465.73	6.94 **	1062.49	6.41 **	1283.92	6.87 **	1925.07	10.65 **
11	(553) Detroit, MI	984.20	5.07 **	1321.79	6.16 **	572.24	2.79 **	1485.01	9.23 **	1843.46	10.17 **	1088.95	6.21 **
19	(554) Denver, CO	573.60	2.89 **	437.09	1.99 *	830.39	3.96 **	-328.81	-2.00 *	-476.14	-2.56 **	20.35	0.11
14	(555) Des Moines, IA	-1558.33	-5.40 **	-1488.62	-4.66 **	-1495.73	-4.90 **	-277.47	-1.16	-214.48	-0.79	-204.29	-0.78
12	(556) North Chicago, IL	842.09	3.95 **	1013.69	4.32 **	1480.31	6.59 **	1816.05	10.28 **	2010.82	10.14 **	2481.31	12.90 **
7	(557) Dublin, GA	-537.40	-2.56 **	-500.13	-2.17 *	-633.33	-2.87 **	-12.27	-0.07	41.24	0.21	-97.62	-0.52
6	(558) Durham, NC	894.96	4.51 **	1172.46	5.36 **	853.61	4.08 **	1012.05	6.16 **	1314.72	7.11 **	995.56	5.57 **
3	(561) East Orange, NJ	964.80	5.03 **	734.30	3.46 **	514.14	2.54 *	1968.21	12.40 **	1798.00	10.03 **	1564.62	9.03 **
4	(562) Erie, PA	-611.13	-2.83 **	-803.24	-3.38 **	-837.35	-3.68 **	463.18	2.59 **	284.26	1.42	224.18	1.15
16	(564) Fayetteville, AR	-1028.63	-5.06 **	-991.84	-4.42 **	-1239.28	-5.78 **	103.65	0.62	179.31	0.95	-124.79	-0.68
6	(565) Fayetteville, NC	-735.70	-3.68 **	-785.83	-3.57 **	-859.20	-4.08 **	266.46	1.61	244.76	1.32	130.66	0.73
19	(567) Fort Lyon, CO	-203.21	-0.86	-936.18	-3.60 **	-959.76	-3.85 **	892.47	4.55 **	169.41	0.77	129.36	0.61
13	(568) Black Hills-Fort Meade, SD	409.89	1.59	703.19	2.30 *	164.31	0.56	718.31	3.37 **	1092.51	4.22 **	653.40	2.60 **
21	(570) Fresno, CA	355.09	1.75	493.74	2.20 *	181.81	0.85	678.87	4.04 **	817.19	4.32 **	522.49	2.86 **
8	(573) Gainesville, FL	290.97	1.55	402.44	1.93	310.62	1.56	295.17	1.89	367.48	2.08 *	289.57	1.70
19	(575) Grand Junction, CO	-250.99	-1.07	-464.63	-1.81	-369.03	-1.50	44.11	0.23	-147.58	-0.68	-51.96	-0.25
12	(578) Hines, IL	1044.24	5.38 **	1076.14	5.02 **	760.89	3.72 **	1179.43	7.34 **	1220.52	6.74 **	937.40	5.35 **
16	(580) Houston, TX	1119.71	5.87 **	1137.75	5.39 **	646.88	3.21 **	1384.62	8.76 **	1433.29	8.04 **	945.19	5.49 **
9	(581) Huntington, WV	-578.62	-2.94 **	-630.23	-2.90 **	-724.57	-3.50 **	84.88	0.52	58.81	0.32	-62.88	-0.35
11	(583) Indianapolis, IN	481.97	2.49 *	626.32	2.93 **	490.14	2.40 *	152.44	0.95	302.50	1.67	212.16	1.21
14	(584) Iowa City, IA	-368.62	-1.74	-1377.11	-5.90 **	-450.40	-2.02 *	-161.50	-0.92	-1128.89	-5.73 **	-222.72	-1.17
12	(585) Iron Mountain, MI	-1585.42	-6.52 **	-1643.66	-6.17 **	-1779.55	-6.96 **	-52.84	-0.26	-87.68	-0.39	-276.99	-1.27
16	(586) Jackson, MS	557.41	2.84 **	458.86	2.12 *	489.86	2.37 *	339.39	2.09 *	287.23	1.57	317.69	1.79
15	(589) Kansas City, MO	373.33	1.90	236.15	1.09	351.83	1.70	-123.26	-0.76	-234.44	-1.28	-92.09	-0.52
6	(590) Hampton, VA	424.54	2.09 *	361.66	1.61	222.66	1.04	488.12	2.90 **	452.80	2.39 *	322.78	1.76
22	(593) Las Vegas, NV	-269.21	-1.34	-363.04	-1.63	-651.33	-3.06 **	701.71	4.20 **	612.19	3.26 **	301.69	1.66
4	(595) Lebanon, PA	44.06	0.22	306.65	1.38	-290.98	-1.37	705.66	4.23 **	979.15	5.22 **	370.71	2.04 *
9	(596) Lexington, Leestown, KY	897.82	4.56 **	813.12	3.74 **	820.68	3.96 **	697.56	4.28 **	641.72	3.50 **	673.08	3.79 **
14	(597) Lincoln, NE	-810.84	-2.42 *	-749.85	-1.83	-912.26	-2.34 *	-0.50	0.00	35.10	0.10	-76.19	-0.23
16	(598) Little Rock, AR	1400.96	7.36 **	1338.70	6.36 **	1124.91	5.60 **	1382.75	8.77 **	1361.94	7.66 **	1145.21	6.67 **
22	(600) Long Beach, CA	1771.33	9.09 **	1699.28	7.89 **	1458.33	7.10 **	1585.14	9.82 **	1531.32	8.42 **	1314.75	7.48 **
9	(603) Louisville, KY	232.77	1.20	106.12	0.49	258.68	1.26	739.15	4.60 **	618.96	3.41 **	782.64	4.47 **
22	(605) Loma Linda, CA	1236.05	6.37 **	843.94	3.93 **	953.39	4.66 **	1126.71	7.01 **	744.35	4.11 **	876.36	5.00 **
12	(607) Madison, WI	714.87	3.47 **	735.03	3.24 **	507.04	2.34 *	-862.46	-5.06 **	-786.40	-4.10 **	-972.47	-5.24 *
1	(608) Manchester, NH	-651.79	-3.00 **	-898.01	-3.75 **	-740.14	-3.23 **	385.78	2.14 *	157.59	0.78	280.34	1.43
15	(609) Marion, IL	-1112.35	-5.70 **	-1116.22	-5.18 **	-1205.99	-5.86 **	-632.77	-3.92 **	-603.93	-3.32 **	-714.77	-4.06 *

RAND*MR1629-TD.11d*

Table D.11—continued

		VERA 3						VA DCGs					
		ARC		HERC		DSS		ARC		HERC		DSS	
	R-Squared	0.26		0.23		0.24		0.50		0.45		0.44	
Variable Category		Estimate	t-Statistic	Estimate	t-Statistic	Estimate	t-Statistic	Estimate	t-Statistic	Estimate	t-Statistic	Estimate	t-Statistic
VISN	(Code) Facility Location												
11	(610) NIHCS-Marion, IN	1997.55	8.72 **	3109.18	11.64 **	1531.78	5.97 **	2949.88	15.54 **	4206.70	18.65 **	2645.09	12.05 **
21	(612) NCHCS/Martinez, CA	-262.66	-1.38	-121.93	-0.58	-64.31	-0.32	-62.61	-0.40	110.55	0.62	143.88	0.84
5	(613) Martinsburg, WV	153.50	0.76	-199.60	-0.90	-23.60	-0.11	552.48	3.31 **	228.24	1.22	391.22	2.15 *
9	(614) Memphis, TN	639.87	3.35 **	783.14	3.71 **	633.78	3.15 **	512.97	3.24 **	687.29	3.86 **	554.28	3.22 **
13	(618) Minneapolis, MN	578.09	3.02 **	457.25	2.16 *	603.09	2.99 **	74.09	0.47	-76.39	-0.43	152.47	0.88
7	(619) CAVHCS- Montgomery, AL	67.10	0.32	-76.18	-0.32	-63.98	-0.28	1102.01	6.40 **	1063.36	5.30 **	1047.45	5.38 **
3	(620) Montrose, NY	1077.97	4.54 **	2172.98	7.35 **	1430.32	5.11 **	2229.95	11.35 **	3778.43	15.14 **	3002.24	12.54 **
9	(621) Mountain Home, TN	279.79	1.42	269.80	1.24	190.16	0.91	-256.34	-1.57	-256.84	-1.39	-289.82	-1.63
9	(622) Murfreesboro, TN	-630.43	-3.17 **	-1674.54	-7.61 **	-264.87	-1.26	-135.25	-0.82	-1098.32	-5.91 **	240.90	1.34
16	(623) Muskogee, OK	-421.88	-2.08 *	-577.48	-2.58 **	-622.97	-2.91 **	495.47	2.95 **	365.48	1.93	286.41	1.56
9	(626) Nashville, TN	294.40	1.53	303.66	1.43	303.55	1.50	359.03	2.26 *	391.54	2.18 *	403.71	2.33 *
16	(629) New Orleans, LA	1084.19	5.60 **	1153.38	5.39 **	793.55	3.89 **	1476.96	9.21 **	1576.97	8.73 **	1198.49	6.86 **
3	(630) New York, NY	1402.08	7.04 **	1244.75	5.66 **	826.84	3.94 **	1945.57	11.80 **	1786.89	9.62 **	1383.29	7.70 **
1	(631) Northampton, MA	-644.57	-2.82 **	-887.94	-3.54 **	152.35	0.63	149.69	0.79	-53.88	-0.25	942.95	4.58 **
3	(632) Northport, NY	1880.82	9.46 **	1619.53	7.37 **	2178.45	10.38 **	2027.46	12.31 **	1758.27	9.47 **	2362.49	13.16 **
16	(635) Oklahoma City, OK	122.40	0.63	-0.58	0.00	-28.50	-0.14	310.64	1.94 *	216.92	1.20	181.66	1.04
14	(636) Omaha, NE	858.92	4.24 **	991.76	4.44 **	1151.76	5.39 **	795.66	4.74 **	962.94	5.10 **	1127.28	6.17 **
6	(637) Asheville, NC	377.81	1.84	526.88	2.33 *	-163.03	-0.75	719.21	4.22 **	908.85	4.75 **	197.61	1.07
21	(640) Palo Alto, CA	2521.31	12.73 **	3020.23	13.79 **	2944.44	14.08 **	2941.95	17.93 **	3470.67	18.77 **	3427.09	19.15 **
4	(642) Philadelphia, PA	409.72	2.14 *	781.89	3.69 **	537.76	2.67 **	1248.92	7.88 **	1639.75	9.17 **	1377.19	7.98 **
18	(644) Phoenix, AZ	473.18	2.42 *	292.53	1.36	579.73	2.82 **	418.68	2.59 **	247.80	1.36	553.49	3.14 **
4	(646) Pittsburgh-University Drive, PA	864.22	4.38 **	748.03	3.42 **	556.97	2.67 **	1373.87	8.41 **	1238.32	6.70 **	1083.82	6.07 **
15	(647) VAMC Poplar Bluff, MO	-1205.51	-5.54 **	-1186.31	-4.95 **	-1432.42	-6.25 **	-30.73	-0.17	18.50	0.09	-272.54	-1.39
20	(648) Portland, OR	1559.17	8.11 **	1375.98	6.47 **	1366.79	6.74 **	945.02	5.93 **	757.18	4.22 **	812.20	4.68 **
18	(649) Prescott, AZ	-980.53	-4.31 **	-1115.76	-4.46 **	-1200.15	-5.01 **	-55.23	-0.29	-168.05	-0.80	-275.26	-1.34
1	(650) Providence, RI	-381.76	-1.88	-638.29	-2.84 **	-516.21	-2.41 *	-176.24	-1.05	-417.59	-2.20 *	-296.58	-1.62
6	(652) Richmond, VA	1286.20	6.48 **	1403.77	6.41 **	1447.01	6.92 **	709.89	4.32 **	852.02	4.60 **	933.75	5.21 **
20	(653) Roseburg, OR	-257.57	-1.22	-401.93	-1.72	-566.37	-2.54 *	583.84	3.33 **	467.61	2.38 *	265.53	1.39
21	(654) Reno, NV	-174.53	-0.85	-87.17	-0.39	-402.36	-1.86 *	150.86	0.89	264.43	1.38	-55.10	-0.30
11	(655) Saginaw, MI	-501.78	-2.37 *	-490.92	-2.11 *	-791.99	-3.55 **	520.04	2.97 **	557.57	2.84 **	220.61	1.16
13	(656) St. Cloud, MN	-426.50	-1.85	-503.57	-1.99 *	-495.65	-2.04 *	35.28	0.18	-7.48	-0.03	-2.76	-0.01
15	(657) St Louis, John Cochrane, MO	410.38	2.14 *	328.98	1.55	356.20	1.76	532.56	3.35 **	457.17	2.55 **	510.57	2.95 **
6	(658) Salem, VA	429.15	2.13 *	836.48	3.77 **	287.49	1.36	437.27	2.63 **	872.99	4.66 **	321.59	1.77
6	(659) Salisbury, NC	176.56	0.90	216.83	1.00	-150.19	-0.73	1142.00	7.02 **	1197.88	6.53 **	811.77	4.58 **
19	(660) Salt Lake City, UT	911.82	4.65 **	851.75	3.93 **	793.84	3.84 **	406.98	2.51 *	356.15	1.95	338.22	1.91 *
21	(662) San Francisco, CA	1488.82	7.49 **	1420.65	6.47 **	1683.05	8.03 **	1999.06	12.14 **	1943.36	10.48 **	2214.14	12.35 **
20	(663) Seattle, WA	207.76	1.08	244.69	1.14	232.42	1.14	539.66	3.39 **	517.80	2.86 **	538.64	3.08 **
22	(664) San Diego, CA	1448.47	7.52 **	1333.22	6.26 **	1201.19	5.92 **	2022.91	12.69 **	1904.22	10.59 **	1790.17	10.30 **
19	(666) Sheridan, WY	404.20	1.57	426.12	1.51	243.22	0.90	432.63	2.03 *	492.34	2.07 *	311.19	1.34
16	(667) Shreveport, LA	471.21	2.43 *	391.28	1.82	140.33	0.69	519.50	3.23 **	481.37	2.66 **	213.95	1.22
20	(668) Spokane, WA	-516.23	-2.51 *	295.82	1.31	-654.48	-3.02 **	-102.73	-0.60	730.15	3.82 **	-229.46	-1.24
2	(670) VAMC Syracuse, NY	-1197.92	-4.23 **	-1183.87	-3.80 **	-1200.47	-4.03 **	95.31	0.41	46.40	0.18	81.60	0.32

Table D.11—continued

		VERA 3						VA DCGs					
		ARC		HERC		DSS		ARC		HERC		DSS	
	R-Squared	0.26		0.23		0.24		0.50		0.45		0.44	
Variable Category		Estimate	t-Statistic	Estimate	t-Statistic	Estimate	t-Statistic	Estimate	t-Statistic	Estimate	t-Statistic	Estimate	t-Statistic
VISN	(Code) Facility Location												
17	(671) San Antonio, TX	660.52	3.43 **	561.18	2.64 **	748.96	3.69 **	845.47	5.31 **	750.28	4.17 **	946.35	5.45 **
8	(673) Tampa, FL	297.27	1.59	278.82	1.35	345.80	1.75	256.07	1.65	263.14	1.51	334.15	1.98 *
17	(674) Temple, TX	408.11	1.99 *	235.96	1.03	-212.19	-0.97	924.57	5.45 **	759.75	3.93 **	352.80	1.88
12	(676) Tomah, WI	142.12	0.59	263.36	1.00	-3.63	-0.01	1319.38	6.66 **	1468.12	6.63 **	1172.61	5.44 **
15	(677) VAMC Topeka, KS	640.24	3.20 **	230.62	1.04	596.43	2.83 **	254.96	1.54	-119.67	-0.64	269.54	1.49
18	(678) Tucson, AZ	455.19	2.29 *	359.06	1.64	110.65	0.53	-255.26	-1.55	-343.86	-1.86	-541.24	-3.02 **
7	(679) Tuscaloosa, AL	234.33	1.03	381.03	1.53	57.12	0.24	847.88	4.51 **	1038.66	4.94 **	683.21	3.34 **
20	(687) Walla Walla, WA	-917.58	-4.11 **	-877.86	-3.58 **	-755.23	-3.21 **	473.93	2.56 *	539.97	2.60 **	612.93	3.05 **
5	(688) Washington, DC	959.75	5.03 **	628.67	2.98 **	652.12	3.24 **	1616.58	10.23 **	1298.90	7.29 **	1326.45	7.70 **
1	(689) VACHS, West Haven, CT	1127.74	5.38 **	1175.26	5.00 **	1228.36	5.47 **	1639.31	9.44 **	1646.76	8.29 **	1728.54	8.99 **
22	(691) West Los Angeles, CA	1949.29	10.23 **	1706.20	8.08 **	1403.16	6.97 **	2226.16	14.10 **	1999.83	11.22 **	1711.53	9.93 **
20	(692) White City, OR	-2227.44	-8.63 **	-2098.23	-7.42 **	-2274.51	-8.38 **	-969.57	-4.54 **	-800.67	-3.35 **	-1003.08	-4.32 **
4	(693) Wilkes-Barre, PA	432.73	2.21 *	204.37	0.94	-202.51	-0.98	940.22	5.79 **	728.73	3.98 **	311.49	1.76
12	(695) Milwaukee, WI	1076.63	5.48 **	852.20	3.92 **	968.69	4.68 **	1112.41	6.84 **	893.85	4.87 **	1042.57	5.88 **
18	(756) El Paso, TX	-805.89	-3.89 **	-1156.28	-5.06 **	-1080.38	-4.95 **	484.74	2.82 **	156.42	0.81	182.08	0.97
10	(757) Columbus IOC, OH	-1121.40	-5.38 **	-1383.95	-5.99 **	-982.78	-4.47 **	60.20	0.35	-220.44	-1.13	167.19	0.89
8	(672) San Juan, PR	Reference		Reference		Reference		Reference		Reference		Reference	

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* Indicates statistical significance at 95% confidence level.

** Indicates statistical significance at 99% confidence level.

HERC and DSS systems report information from consolidated facilities at different levels than does the ARC.

Table D.12

Comparison of Facility-Level Regression Results for the Policy Model—ARC, HERC, DSS (Excluding Basic Care Priority 7s)

	VERA 3						VA DCGs					
	ARC		HERC		DSS		ARC		HERC		DSS	
R-Squared	0.48		0.50		0.52		0.36		0.40		0.43	
Variable	Estimate	t-Statistic	Estimate	t-Statistic	Estimate	t-Statistic	Estimate	t-Statistic	Estimate	t-Statistic	Estimate	t-Statistic
Intercept	-1857.17	-1.23	-2349.82	-1.40	-2438.95	-1.57	-2754.97	-1.82	-3693.64	-2.18*	-3748.08	-2.53*
Rural/Urban												
Urban	-26.37	-0.06	161.80	0.32	350.65	0.75	-130.96	-0.29	73.93	0.14	266.31	0.59
Suburban	-119.09	-0.25	237.48	0.45	201.46	0.42	-314.06	-0.66	57.41	0.11	36.04	0.08
Rural	-454.71	-0.85	-328.22	-0.55	-179.94	-0.33	-427.21	-0.80	-299.79	-0.50	-158.58	-0.30
Very Rural	Reference		Reference		Reference		Reference		Reference		Reference	
Residents per Full-time MD	480.11	3.08**	551.18	3.19**	457.21	2.86**	-382.41	-2.45*	-313.26	-1.80	-371.26	-2.44*
VA Labor Index	1804.31	1.13	1771.71	1.00	1925.40	1.17	3270.45	2.04*	3690.90	2.06*	3770.88	2.41*
Food Cost Index	25.70	1.62	28.91	1.65	29.06	1.79	9.50	0.60	14.24	0.81	14.41	0.93
Energy Price (dollars per million BTUs)	-45.29	-1.04	-46.86	-0.97	-45.81	-1.02	18.53	0.42	18.26	0.37	19.79	0.46
Contract Labor Costs	-4536.60	-2.33*	-4611.92	-2.14*	-4765.09	-2.39*	-4460.79	-2.29*	-4969.49	-2.28*	-5105.36	-2.68**
Square Feet per Acre	0.84	0.39	0.92	0.38	-1.18	-0.53	4.94	2.26*	4.97	2.04*	2.77	1.30
Square Feet per Patient	6.93	2.56*	12.07	4.04**	6.75	2.44*	6.27	2.32*	12.02	3.98**	6.89	2.61*
Research Costs per 1000 Users	0.004	5.04**	0.004	5.11**	0.005	5.83**	0.004	5.18**	0.004	4.96**	0.005	6.05**

* Indicates statistical significance at 95% confidence level.

** Indicates statistical significance at 99% confidence level.

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